Appendix A: Association

Association Business Plan

DRAFT - September 18, 2000

The goal of the effluent trading project is to create a trading system that is environmentally and legally sound; works within existing regulatory programs; allows trades to occur in a dynamic, market-based manner, and that is grounded in environmentally protective requirements. A key underlying concept that shapes the trading system framework is that the rules to ensure environmentally sound and enforceable trades are set out in advance by the regulatory agencies. Then day to day trading occurs as a series of business transactions in a market environment. The Effluent Trading Association is an essential component of the framework. The Association enables trading to occur outside of government venues, in a locally controlled, market setting.

The SW Idaho Resource Conservation & Development Council has volunteered to "incubate" the Association during its inception phase. The RC&D's role in southwest Idaho is to help community members develop tools to effectively manage natural resources, including grant funding. Because there is likely to be substantial overlap in membership between the RC&D and the Association, a short-term relationship with the RC&D was deemed logical. The Association will seek independent incorporation and 501(c)(3) status in spring of 2000. If the Association emerges into a self-sustaining organization, and membership needs dictate, the Association may seek 501(c)(6)[1] status in the future.

Proposed Association Name: Idaho Clean Water Cooperative

Goals

- To support the start-up of an effluent trading program, develop the essential tools of an administrative support system for trading, and provide outreach to raise awareness of trading opportunities.
- To provide the Lower Boise River watershed trading system with core services, as described below, in the most efficient and effective manner possible. The support provided will be scaled to the level of activity and the amount of trading.
- As necessary, re-evaluate the role of the Association as effluent trading in the basin evolves over time, and as trading develops in new basins.
- To eventually become a financially self-sufficient entity.

[1]501(c)(6) organizations are also referred to as "Business Leagues." Unlike 501(c)(3)'s, Business Leagues may work for the enactment of laws to advance the common business interests of the organization's members.

Core Services

Trade Database.

The Association will both develop and implement a trade database to facilitate effluent trading in the region. This database is required for NPDES permit holders to engage in trading. Major functions of the database will be:

- tracking all trades in a central repository;
- reconciling all trades in the market area to ensure credits are not used more than once;
- providing key trading information and adjusted effluent limits to trading parties, regulatory agencies, and the public; and
- producing reports required for permit compliance.

Records Maintenance and Report Preparation.

The Association will receive Trade Notification Forms (and Trade Reduction Credit Certificates, if a point source-nonpoint source trade) from the point source purchasing the credits, and check these forms for accuracy. The Association will be responsible for preparing and submitting a *Trade Summary Report* to EPA, DEQ and the trading parties on a monthly basis, for each point source with purchased and/or sold credits. *Trade Summary Reports* will also be posted on the Association website. The Association will also maintain files pertaining to trades, and prepare trade summaries from information obtained in the trading database.

Public Information & Outreach.

The Association will be responsible for making trade transaction information available to the general public. Primarily, this information will be pulled from the Trade Notification Forms and Reduction Credit Certificates. Guidelines for public access to this information will be developed by the Association Board, with assistance from EPA.

In addition, the Association will establish and implement an effluent trading Outreach Program designed to educate the public and potential trading parties about the effort. The primary target audience will be the agriculture community. As interest develops, outreach will aim towards additional stakeholders outside of the Boise River basin. The level and direction of outreach effort will be consistent with the schedule for TMDL development (i.e., will increase in scope as the need for trading grows), but will likely involve significant up-front work developing promotional materials and determining target audiences and venues.

Potential Additional Services, as Need Emerges

Facilitate Trade Transactions.

As trading emerges, the purchase of credits will likely be transacted via *Requests for Proposals* for credit reductions. The Association will help establish the minimum requirements for conducting Association sponsored trade transactions, and will advise trading parties to ensure they're meeting all necessary requirements.

Support for Individual Land Owners

The Association could provide the following services to support individual land owner participation in trading. Specific approaches will be determined as the demand for trade services emerges.

1. Municipalities could contract with the Association for credits and the Association could contract with individual landowners. Contracts with municipalities would likely be for more than one year, but contracts with individual land owners could be annual or longer. (Middle Man)
2. The Association could identify and assist individual land owners interested in selling credits, bringing a number of land owners together to create a trade with a municipality. Once the land owner participants are identified, they would enter directly into on or more contracts with the municipality. ('Dating' Service)
3. The Association could purchase credits from individual land owners at its own risk, pool then, and resell to municipalities.
4. The Association could create a spot market by creating a registry; anyone with excess credits could register the credits as available for sale.

BMP Verification

Some stakeholders have expressed an interest in having the Association provide independent third party credit verification. Credit verification would generally consist of satisfying the monitoring requirements for measured or calculated credits specified in the BMP list. The Association could provide credit verification services by either:

1. Maintaining a list of qualified contractors; or
2. Retaining contractors to provide credit verification services on an as needed basis.

In either case, the credit user would still be liable for credit validity (e.g. would sign the credit reduction certificate).

Budget. The Association budget includes estimated one-time start-up expenses, and estimated annual operating expenses. These operating expenses are then projected out for a 3-year period.

Start-up Expenses	***one-time***
Office start-up	$ 300
Letterhead/envelopes	$ 300
Misc. supplies	$ 200
Phone	$ 100
Fax/copier	$ 200
Answering machine	$ 100
Install phone lines	$ 200
Computer, monitor, printer	$ 3,000
ArcView & database	$ 1,500
Incorporation fees	$ 250

501(c)(3) filing fee	$ 250
Database design	$20,000
Webpage design	$ 3,000
Legal work (10 hrs X $100)	$ 1,000
Total	**$30,400**

Operating Expenses	***monthly***	***annually***
Office space	$ 150	$ 1,800
Phone	$ 100	$ 1,200
Internet access	$ 20	$ 240
General supplies	$ 50	$ 600
Payroll (1 person at 50% time)	$2,083	$25,000
Business insurance	$ 83	$ 1,000
Printing costs	$ 200	$ 2,400
Outreach activities	$ 100	$ 1,200
Board meetings (4/year)		$ 800
Agency meetings		$ 800
Total		**$35,040**

Total Start-up		$ 30,400
Total Annual Operating	$ 35,040	
3-year Total Operating		$105,120
Grand Total (start-up plus 3-year on-going)		**$135,520**

Necessary Staff

1 part-time person to:

- provide administrative support
- assist in development of and support to the Board of Directors
- support the Board in further development of trading rules
- maintain trading website and database
- conduct community outreach activities
- mediate/support trading party transactions

Membership

A draft of Association Articles of Incorporation and By-Laws, including membership criteria, board makeup and voting procedures, has been completed. Generally, Association membership will be required for anyone in Idaho who engages in effluent trading (as permitted), and is also open to anyone interested in trading and/or the environmental affects of trading. Potential members include agricultural entities that contribute to discharges into

the Lower Boise River and its tributaries; municipalities and industries that discharge directly or indirectly into the Lower Boise River and its tributaries; environmental interests; and the general public. The Association's Board of Directors will be composed of 6 members: 2 point source interest group representatives, 2 nonpoint source interest group representatives, 1 environmental interest group representative and 1 public at large representative, to ensure a good balance of interests, and opportunities for shifting coalitions.

Potential Sources of Funding

It is anticipated that the initial start-up funding will be from a grant. Potential grant sources include:

- Rockefeller Family Fund
- Ittelson Foundation Environmental Grants
- Bullitt Foundation
- Charles Stewart Moss Foundation
- Global Environment Project Institute (local)
- Intermountain Gas Industries Foundation, Inc. (local)
- Margaret W. Reed Foundation (local)
- Wal-Mart Foundation

Early funding will also be solicited via effluent trading stakeholder cash donations and in-kind contributions. The Association will seek at least 10 contributors for $1000 each. These funds may be necessary to support additional stakeholder involvement in program development in years 2 and 3.

The effluent trading market in the Lower Boise watershed is expected to emerge gradually over the next several years, along with TMDL decisions. As more demand for trading materializes, it is expected that membership fees and trade transaction fees will meet ongoing Association expenses.

Timeline

Agree on a name for the Association, check with Secretary of State's Office (?) to ensure the name is not being duplicated.	COMPLETED
Draft and submit EPA's Sustainable Development Challenge Grant Application. Begin work on other grant applications, as necessary.	COMPLETED
Write and file Articles of Incorporation. These are typically difficult to amend, so should be written in general terms.	COMPLETED
Write Association Bylaws. These are fairly easy to amend and do not have to be in "perfect" order to file for 501(c)(3) status.	COMPLETED

Recruit/Elect Initial Board Members	09/00
Hold first Board meeting	09/00
File for 501(c)(3) status with the IRS: - Form SS-4 - Form 1023 (filing fees are $150 to $500; usually takes 100 days to process) - Form 8718 Will also need an explanation of where initial funds will originate, lobbying information; fee for service information; statement of revenues and expenses for two projected years (and "best guess" for current year); and a balance sheet.	09/00
Hire Association Staff	09/00
Complete local/state tax exempt applications, as necessary	09/00
Obtain a Business License	09/00
Select database development contractor	12/00
Begin Database & Website Development	1/01
Develop Effluent Trading Project Outreach Plan	1/01
Complete Database & Website	1/01
Begin providing records/maintenance services	03/01
Implement Outreach Plan	01/01-12/02
Expect TMDL Submittal	12/01

ARTICLES OF INCORPORATION
Of
The Idaho Clean Water Cooperative
DRAFT 09/18/00

The undersigned incorporator(s), each being a natural person 18 years of age or older, in order to form a corporate entity under Idaho Statutes, Chapter_____, adopts the following articles of incorporation.

ARTICLE I

NAME/REGISTERED OFFICE

The name of this corporation shall be the **Idaho Clean Water Cooperative**, located at (street address, city, state, zip).

ARTICLE II

PURPOSE

This corporation is organized as a nonprofit corporation exclusively for charitable, scientific and educational purposes within the meaning of Section 501 (c) (3) of the Internal Revenue Code of 1986, by lessening the burdens of government of the State of Idaho. The primary activity of the corporation shall be to provide the Lower Boise and other Idaho watershed's trading systems with core administrative services to help improve water quality conditions. All funds, whether income or principal, and whether acquired by gift or contribution or otherwise, shall be devoted to said purposes.

ARTICLE III

EXEMPTION REQUIREMENTS

The following shall operate at all times as conditions restricting the operations and activities of the corporation:

1. No part of the net earnings of the organization shall inure to the benefit of, or be distributable to its members, trustees, officers, or others private persons, except that the organization shall be authorized and empowered to pay reasonable compensation for services rendered and to make payments and distributions in furtherance of the purpose set forth in the purpose clause hereof.

2. No substantial part of the activities of the corporation shall constitute the carrying on of propaganda or otherwise attempting to influence legislation, or any initiative or referendum before the public, and the corporation shall not participate in, or intervene in (including by publication or distribution of statements), any political campaign on behalf of, or in opposition to, any candidate for public office.

3. Notwithstanding any other provisions of this document, the organization shall not carry on any other activities not permitted to be carried on (a) by an organization exempt from federal income tax under section 501(c)(3) of the Internal Revenue Code, or corresponding section of any future federal tax code, or (b) by an organization, contributions to which are deductible under section 170 (c)(2) of the Internal Revenue Code, or corresponding section of any future federal tax code.

ARTICLE IV

DURATION

The duration of the corporate existence shall be perpetual.

ARTICLE V

MEMBERSHIP/BOARD OF DIRECTORS

Membership is open to the general public and is required of all trading parties. The management of the affairs of the corporation shall be vested in the Board of Directors, as defined by the Corporation's Bylaws. No Director shall have any right, title, or interest in or to any property of the corporation.

The number of Directors constituting the initial Board of Directors is 4, their names and addresses being as follows:

Name
Address
Name
Address
Name
Address

The first four (4) members of the initial Board of Directors shall select two (2) additional Board members that represent select interest groups as articulated in the Bylaws. To establish a member rotation, the Board, at its initial meeting, shall set two (2) year terms for three (3) of the initial Board members. The terms for the remaining Board members and duly elected successors shall be set for three (3) years.

ARTICLE VI

PERSONAL LIABILITY

No member, officer, or Director of this corporation shall be personally liable for the debts or obligations of this corporation of any nature whatsoever, nor shall any of the property of the members, officers, or Directors be subject to the payment of the debts or obligations of this corporation.

ARTICLE VII

DISSOLUTION

Upon the dissolution of the corporation, the Board of Directors shall, after paying or making provision for the payment of all the liabilities of the corporation, dispose of all of the assets of the corporation to the State of Idaho or its political subdivision, or to such organization(s) organized and operated for charitable, educational or scientific purposes as shall at the time qualify as exempt organization(s) under Section 501 (c) (3) of the Internal Revenue Code of 1986 (or the corresponding provision of any future United States Internal Revenue Law), in such manner as the Board of Directors shall determine.

ARTICLE VIII

INCORPORATOR(S)

The incorporator(s) of this corporation is/are:

The undersigned incorporator(s) certify(ies) that she/he/they execute(s) these articles for the purposes herein stated.

Signature
Date
Signature
Date
Signature
Date

BYLAWS
of the
Idaho Clean Water Cooperative, Incorporated
DRAFT 09/18/00

ARTICLE I - NAME, PURPOSE

A. The name of the organization shall be the Idaho Clean Water Cooperative, Incorporated.

B. The Idaho Clean Water Cooperative (The Cooperative) is organized exclusively for charitable, scientific and educational purposes, consistent with requirements of IRS Chapter 3, Section 501(c)(3), by lessening the burdens of government within the State of Idaho. The primary activities of the corporation shall support the start-up of an effluent trading program, develop the essential tools of an administrative support system for trading, provide outreach to raise awareness of trading opportunities, and operate and administer the trading system. The Cooperative will enable trading to occur outside of government venues, in a locally controlled, market setting.

ARTICLE II - MEMBERSHIP

A. Cooperative membership is open to anyone.
B. All parties participating in the effluent trading program must be members of the Cooperative.

ARTICLE III - BOARD OF DIRECTORS

A. **Size**: The Board of Directors, hereinafter referred to as the Board, shall be composed of 6 members: 2 point source interest group representatives, 2 nonpoint source interest group representatives, 1 environmental interest group representative and 1 public at large representative.

B. **Duties**: The Board is responsible for overall policy and direction of the Cooperative, and delegating responsibility for day-to-day operations to the Cooperative Director and committees. As a general guide, and not by way of limitation, the Board shall have the following functions, duties, and responsibilities:

1. Define the objectives and goals for the Cooperative.

2. To prepare an annual budget and an annual plan of work.

3. To appoint committees to assist in carrying out the purposes, functions, duties, and responsibilities of the Cooperative.

    1. To select and employ a Cooperative Director and such other persons as it may deem
    2. necessary for the successful prosecution of the purposes of the Cooperative.

4. Undertake other activities and enter into agreements as necessary to carry out the purposes and functions of the Cooperative.

C. **Compensation**: The Board receives no salary but shall be reimbursed for reasonable expenses.

D. **Resignation, Termination and Absences**. Resignation from the Board must be in writing and received by the Secretary. A Board member shall be automatically removed from the Board if they have unexcused absences from more than two consecutive Board meetings. Board members may also be removed for cause by a unanimous vote of all other Board members at a special meeting called for that purpose.

E. **Vacancies.** Vacancies in office due to death, resignation, removal, disqualification or otherwise, shall be filled for the unexpired term of office vacated as follows:

1. The vacancy shall be filled by a representative of an interest group representing the same general area of interest as the departing Board member. The Board may select a new Board member from a list of names submitted by the interest group represented by the vacating member. New members are elected by a majority vote of the remaining Board members at the Board meeting following the vacancy.

2. A vacancy of the officers shall be filled by election by a majority vote of the Board.

F. **Elections.** Election of new Board members or election of current Board members to a second term will occur as the first item of business at the annual meeting. Members will be elected by a majority vote of the current Board.

G. **Terms.** Board members will serve 3 year terms with no member allowed to serve for more than two consecutive terms. Initial terms of the first board members will be either 2 or 3 years to establish a rotation as determined by the Board at its initial meeting.

ARTICLE IV - MEETINGS

A. **Annual Board and Membership Meeting:** The Board will set the date, time, and location of the annual meeting, at which members will be invited to attend. At the annual meeting, the Board will give a report on the "State of the Idaho Clean Water Cooperative" to the Cooperative membership, elect new Board members, and adopt the budget and plan of work for the coming year. The meeting will be conducted by the Board's Chair.

B. **Board Meetings**: The Board will meet at least semi-annually at an agreed upon time and place, and as necessary to carry out the business of the Cooperative. The Board Chair may call special meetings as necessary.

C. **Public Participation:** Meetings of the Board shall be open to the public. The Board may, by 2/3 vote, move into Executive session to discuss any matter authorized pursuant to Idaho Code 67-2345(1), The Cooperative will not knowingly hold a meeting at a place where discrimination is practiced.

D. **Notice:** Notice of meetings shall be provided to all members at least one week in advance of the meeting. Notice of Special meetings called by the Chair shall require at least 48 hours notice

E. **Quorum:** Except as otherwise provided for in the election of Board members and officers in these Bylaws, four members of the Board shall be considered a quorum for the transaction of business at meetings. The act of the majority of the members constituting the quorum shall be an act of the Board.

F. **Conduct:** Unless otherwise agreed by attendees, Robert's Rules of Order shall govern on all matters of parliamentary procedure.

G. **Minutes**: Minutes shall be taken at all meetings. All minutes shall be available to the public in a reasonable time period. All meeting minutes shall contain at least the following:

Names of Board members present
All motions proposed and their disposition
The results of all votes

ARTICLE V - OFFICERS

A. The officers of the Cooperative shall be elected for two year terms of office by the Board. All Board members are eligible to serve as officers. Said officers shall take over their offices and responsibilities thereof at the end

of business of the annual meeting held in December, on odd numbered years. The officers and their duties shall be as follows:

1. **Chair:** The Chair shall preside at all meetings of the Cooperative and the Board, shall be entitled to debate and vote as a member of the Board on all matters , and shall perform such other duties as may be assigned to him/her by action of the Cooperative or Board. The Chair shall be limited to two consecutive two year terms of office.

2. **Vice-Chair:** In the event of the absence of the Chair, or his/her inability to act, the Vice-Chair shall act in his/her stead. The Vice-Chair shall have the responsibilities for setting up the annual meeting and any tours or special events. When special programs are desired at the meetings of the Cooperative or the Board, the Vice-Chair shall assist in scheduling such programs. The Vice-Chair shall be limited to two consecutive two year terms of office.

3. **Secretary/Treasurer:** The Secretary/Treasurer, or their delegee, shall (a) keep minutes of the proceedings of the Cooperative and Board in appropriate books provided for that purpose, (b) see that all notices are duly given as required by Law, regulation, or Bylaws of the Cooperative, (c) have general charge and custody of and be responsible for all funds of the corporation, (d) deposit all monies received, in the name of the corporation, in such banks or other depository as may be designated by the Cooperative, (e) keep current and complete books and records of account, and (f) perform such other duties incident to the office of Secretary/Treasurer, and such other duties as may be assigned by the Chair.

4. Cooperative Director: Under the authority of the Board, the Cooperative Director shall have daily supervision, direction and control of the business affairs and operation of the Cooperative in accordance with the Articles of Incorporation, the Bylaws, and the policies laid down by the Board.

ARTICLE VI - COMMITTEES

Ad hoc committees may be appointed by the Board at any time they are deemed necessary. All ad hoc committees will have a definite assignment and time frame for their existence. The ad hoc committees may be disbanded by the Board for any reason that is in the interests of the Cooperative.

ARTICLE VII - BUDGET AND SHARING OF COSTS

A. The Cooperative shall adopt an annual budget based upon anticipated contributions, dues, fees, and expenses.

B. The fiscal year for the Cooperative will be from January 1 to December 31 of each calendar year.

C. All funds of the Cooperative shall be deposited in such bank or banks as the Board shall designate, and shall be withdrawn only upon check or order of two Board members.

ARTICLE VIII - CONTRIBUTIONS

The recommended dues and fees for each member of the Cooperative shall be set from time to time by the Board. In the event of withdrawal by a member from the Cooperative, said member shall be entitled to no return of any contributions or portion thereof, hereto paid.

ARTICLE IX - BUSINESS

A. **Contracts**: The Board may authorize any officer, agent, or agents of the Cooperative to enter into any contract or execute and deliver any instrument in the name of and on behalf of the Cooperative; and such authority may be general or confined to a specific instance.

B. **Checks, Drafts, Etc**.: All checks, drafts, or orders for the payment of money, notes, or other evidences of indebtedness issued in the name of the Cooperative shall be signed by such officer or officers, agent or agents of the Cooperative, and in such manner as shall from time to time be determined by resolution of the Board.

In the absence of such determination by resolution by the Board, such instruments shall be signed by two members of the Board.

C. **Deposits:** All funds of the Cooperative shall be deposited from time to time to the credit of the corporation in such banks, trust companies, or other depositories as the Board may select.

D. **Gifts**: The Board may accept on behalf of the Cooperative any contribution, gift, bequest, devise, or grant for the general purposes or for any special purpose of the corporation.

ARTICLE X - STAFF

A. The Board will be responsible for providing guidance for the Cooperative Director. Before any additional staff members are hired by the Cooperative, the Board will develop a personnel policy including job descriptions and standards of performance for each employee.

B. Staff members will be under the technical supervision of the Cooperative Director and carry out the directives of the Board. Full and/or part time staff may be hired by the Cooperative.

ARTICLE XI - AMENDMENTS

These Bylaws may be amended at any meeting of the Board by a vote of the Board as set forth in Article IV, provided that the amendment has been submitted in writing to the Board at least 30 days prior to the meeting.

ARTICLE XII - DISSOLUTION

At such time as the Idaho Clean Water Cooperative may be dissolved, all funds will be dispersed in accordance with the Article of Incorporation.

ARTICLE XIII - TAX EXEMPT STATUS

Notwithstanding any other provisions of these bylaws, the Cooperative shall not carry on any other activities not permitted to be carried on (a) by a corporation exempt from Federal Income Tax under Section 501(c)(3) of the Internal Revenue Code of (or the corresponding provisions of any future United States Internal Revenue Law) or (b) by a corporation, contributions to which are deductive under Section 170(c)(2) of the Internal Revenue Code of 1986 (or the corresponding provisions of any future United States Internal Revenue Law).

ARTICLE XIV - INDEMNIFICATION

The Cooperative shall indemnify any present or former director, officer, employee, member or volunteer of this Cooperative, and each such person who is serving or has served, at the request of this Cooperative, as a director, officer, partner, trustee, employee or agency of another corporation, partnership, joint venture, trust, other enterprise, or employee benefit plan to the fullest extent possible against expenses, including attorney's fees, judgments, fines, settlements and reasonable expenses, actually incurred by such person relating to his/her conduct as a volunteer of the corporation or as a director, officer, partner, trustee, employee or agency of another corporation, partnership, joint venture, trust, other enterprise or employee benefit plan, except that the mandatory indemnification required by this sentence shall not apply (i) to breech of duty of loyalty to the Cooperative, or (ii) for acts of omissions not in good faith or which involve intentional misconduct or knowing violation of the law.

The undersigned Chair and Secretary/Treasurer of the Idaho Clean Water Cooperative hereby certify that the above Bylaws were duly adopted by the Cooperative.

Approved [date]

(s) Chair (s) Secretary/Treasurer

_____ _____

Date Date

Appendix B: Ratios

Lower Boise River
Effluent Trading Location Ratios

This document provides information on the location ratios used to trade phosphorus in the Lower Boise River Effluent Trading Project.

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Lower Boise River
Effluent Trading Location Ratios

Introduction

Effluent trading ratios are designed to support the development of a market based system for achieving phosphorus load goals in the Boise River and its tributaries. The ratios provide a way to determine equivalent loads between sources distributed throughout the system of water diversions and inputs to the Boise River. Ratios ensure that the overall load of phosphorus allocated by a TMDL or a no net increase policy does not increase, but can be distributed within a market to find the least cost pathway to achieving a load goal. These ratios were developed for the Lower Boise River Effluent Trading Project. The ratios should not be adapted to other trading markets without re-evaluation of the relationships and flow characteristics.

Description of Location Ratios

The phosphorus sources within the watershed are scattered across the length of the river from Lucky Peak to the confluence with the Snake River. Since irrigation diversions remove flow from the river at many points, the entire load of phosphorus discharged by a source does not reach the mouth of the river. The location of each source is incorporated into its ratio through a mass balance model that accounts for inputs, withdrawals, and groundwater. Location ratios are calculated from each source relative to Parma.

Hydrologic Basis for Establishing Ratios

The ratios are based upon a mass balance model that tracks the flow of water and phosphorus from Lucky Peak dam to Parma. To be consistent with the Draft Lower Boise River TMDL, the mass balance spreadsheet models the average of the 1996 irrigation season, from April 15 to October 15. In total volume, 1996 had a 71st percentile irrigation season, with high flows in the early part of the season, and more typical flows for the later part of the season. The spreadsheet includes a split around Eagle Island, and captures the differences in diversions and inputs between the north and south channels. Nearly twice as much water is diverted from the south channel, which accounts for the fact that the West Boise and Thurman Drain ratios are slightly lower than the ratios for Eagle Drain (north channel) and the Lander Street facility (effluent goes through both channels). The phosphorus loads from each source were adjusted <u>independently</u> to calculate ratios, which represent the amount of a change in a phosphorus load that reaches Parma. This model does not make any assumptions related to the uptake of phosphorus in the Boise River.

To identify the potential for ratio fluctuation among flow years, DEQ analyzed 1996 (a 71st percentile irrigation season total flow) and 1994 (a 29th percentile irrigation season total flow). Since diversions remove a larger proportion of the total river flow during a low flow year, ratios for upstream sources are likely to decline. For example, much more of Boise's effluent is diverted during a year like 1994 than during 1996. Appendix 4A on page 11 compares 1994 and 1996 load weighted ratios.

Effluent Trading Location Ratios
Proposed Set of Ratios

Table 1. Location Ratios for Municipalities

Source Name	RATIO
Lander Street	**0.56**
West Boise	**0.51**
Eagle Island Fish Hatchery	**0.67**
Meridian	**0.75**
Star	**0.75**
Middleton	**0.75**
Nampa Fish Hatchery*	**0.20**
ConAgra / Armour*	**0.20**
Nampa*	**0.20**
Caldwell	**0.89**
Notus	**0.95**

*The Armour, Nampa, and Nampa Fish Hatchery effluents are strongly influenced by the Riverside Diversion, and thus have low ratios.

Table 2. Location Ratios for Tributaries and Drains

Source Name	RATIO
Eagle Drain	**0.63**
Thurman Drain	**0.51**
Fifteenmile Creek	**0.75**
Mill Slough	**0.75**
Willow Creek	**0.75**
Mason Slough	**0.75**
Mason Creek	**0.75**
East Hartley Gulch	**0.80**
West Hartley Gulch	**0.80**
Indian Creek	**0.89**
Conway Gulch	**0.95**
Dixie Drain	**0.96**

Lower Boise River
Effluent Trading Location Ratios

Example Using Location Ratios to Calculate Equivalent Loads

To calculate equivalent loads between the seller and the buyer in a trade, the sources involved in the trade use their ratios to make the buyer's need and the seller's credits equivalent within the watershed. The process of creating equivalent loads, "Parma pounds," involves two steps:

Buyer Ratio * Buyer's Excess= Pounds to buy

Seller Ratio * Seller's Credits = Credits available

If the Lander Street plant has exceeded its allocation by 10 pounds, and Mason Creek has credits to sell, the two could execute a trade. Thus, the City of Boise would have to purchase (10 lbs excess * 0.56 Lander Ratio) = 5.6 pounds. If Mason Creek has 40 pounds of credit to offer at its mouth, those credits translate to 40 lbs * 0.75 Mason Ratio = 30 credits in the market at Parma (Parma Pounds). The purchase made by Boise would be less than its excess at its point of discharge, but would be equivalent in the river due to the adjustments made by the ratios. After the sale, Mason Creek has 30 - 5.6 = 24.4 Parma Pounds. Ignoring price, buyers may try to purchase from a source with a higher ratio, since that source can bring more equivalent credits to market. Ratios establish the Parma Pounds to buy and the supply of equivalent credits.

Lower Boise River
Effluent Trading Location Ratios

Proposed Procedures to Review Location Ratios

This document establishes procedures to review the location ratios published in the State Water Quality Management Plan *(proposed location)* for the Lower Boise River Effluent Trading System. The document provides information on the frequency of the ratios review, party to perform the review, conditions and methodology for revision and implementation of the ratios if revised.

Published Location Ratios

Sources within the watershed are scattered across the length of the river from Lucky Peak to the confluence with the Snake River. Location ratios provide a means to determine equivalent loads between these sources on the river. Since irrigation diversions remove flow from the river at many points, the entire load of phosphorus discharged by a source does not reach the mouth of the river. The location of each source is incorporated into its ratio through a mass balance model that tracks the flow of water and phosphorus from the Lucky Peak Dam to Parma.

Purpose of a Review of the Published Ratios

A routine review of the ratios will ensure the published ratios set reflects current relationships between sources on the river.

Frequency of the Review

The review will be completed every five years, in conjunction with the reissuance of permits for municipalities on the Lower Boise River.

Party to Initiate the Review

The Idaho Division of Environmental Quality will perform the review. Results will be provided to the Effluent Trading Association, if one exists, for use in the trading database.

Conditions Which Constitute a Revision to the Published Ratios

A revision will be required if ratios calculated for each of the five years since the last review show a divergence from the published ratios set by 30% or more. The High to Low Water Year Variation (Appendix 3A) established that a variation less than 30% in the ratios set represents average conditions and is minimal relative to the change in flow values.

Variation greater than 30% in any single year will not constitute a need for revision of the ratios set. The variation must be present in two consecutive years, indicating a trend and permanent change in the flow regime, to require a revision of the published ratios set.

Methodology for Revision of the Published Ratios

Flow conditions for each of the five years from the last review will be input in the mass balance model and ratios calculated. Results from the model will be compared to the published ratio set. A variance of 30% or more on any one ratio occurring in two consecutive years, indicating a trend and permanent change in the flow regime, will require a revision of the current ratios. A notification of the revision will be distributed to all market participants.

Public Review Process for the Revised Ratios Set

Both revisions to the published ratios set and alterations to the methodology utilized to calculate ratios set will be subject to the public review process of the State Water Quality Management Plan.

Effective Date for the Revised Ratios Set

The revised ratios will be effective when the new permits are issued. Any contracts signed after this date will utilize the revised ratios set. Contracts signed prior to this date utilizing the expired ratios set will have a three year period from the effective date to implement the new ratios.

Note: The provision allowing a revision due to catastrophic occurrences which alter flow regime has been removed. Tonya Dombrowski's analysis (Appendix 5A) of the two most likely scenarios resulted in flow variations of less than 10% overall and would, therefore, not necessitate an unscheduled reopening of ratios.

Lower Boise River
Effluent Trading Location Ratios

Appendix 1A - Equations Used in the Mass Balance Model

The mass balance model tracks the flow of water moving through the Boise River and its associated concentration of total phosphorus. The flow and the concentration are used to track the mass load of total phosphorus along the length of the river. Flow, total phosphorus concentration, and the load of total phosphorus are recalculated at each input or diversion until the endpoint of the model, Parma, is reached. Please note that "total phosphorus" is a specific type of laboratory analysis that includes both sediment attached and dissolved phosphorus.

Total Phosphorus Concentration

New total phosphorus concentration in the Boise River =

$$\frac{(\text{River Flow} * \text{River [TP]}) + (\text{Source Flow} * \text{Source [TP]}) + (\text{GroundH2O Flow} * \text{GroundH2O[TP]})}{\text{River Flow} + \text{Source Flow} + \text{GroundH2O Flow}}$$

Where:

River Flow = flow in the Boise River, cfs
River [TP] = concentration of total phosphorus in the river, mg/l
Source Flow = either an input (tributary or treatment plant) or a diversion of water, cfs
Source [TP] = concentration of total phosphorus from a treatment plant or tributary, mg/l
Diversions remove water that contains the concentration of total phosphorus in the Boise River where the withdrawal occurs.
GroundH2O Flow = Flow of groundwater into the Boise River, cfs
GroundH2O [TP] = concentration of total phosphorus in the groundwater, 0.126 mg/l in this model

Total Phosphorus Load

Total Phosphorus Load = New River flow * 5.4 * River [TP]

Where:

New River Flow = net inputs, diversions, and groundwater flow from the previous step, cfs
River [TP] = concentration of total phosphorus as calculated in previous step, mg/l
5.4 = units conversion factor to yield pounds per day

Lower Boise River
Effluent Trading Location Ratios

Appendix 2A - Development Notes

Introduction

This set of notes provides detail on the steps followed to develop draft trading ratios for the Lower Boise River effluent trading development process, as displayed in the document titled "Lower Boise River Effluent Trading Ratios, Second DRAFT Proposal" 11/9/98. The ratios are based upon mass balance modeling for the Lower Boise River, given 1996 standard irrigation season average conditions.

Features:

1996 standard irrigation season average conditions, April 15 to October 15
Loads for tributaries and treatment plants for total phosphorus based on FLUX models
Displays loads from individual sources, and groundwater load
Displays instream phosphorus concentration and accumulated phosphorus load

Hydrology

Incorporates all known inputs and diversions
Incorporates groundwater inflow, with associated phosphorus load
Models the flow split around Eagle Island, and accounts for inputs / diversions on the North and South channels

Eagle Island Flow Split Assumption

The upstream end of Eagle Island is a location where significant gravel deposits may develop in the North Channel of the river. At present, (November, 1998), very little flow is moving through the North Channel due to a very large deposit of cobbles, and gravel. Flood control district 10 will remove much of the material (about 15,000 cubic yards) from the site later this year to open the channel again for irrigation next spring. Though the flow target can be 30% South Channel and 70% North Channel, the actual flow split varies with the deposition of material. For the model, I assumed a 50 / 50 flow split between the channels. The flow split can be altered at any time using cell C29 for the North Channel percentage, and C30 for the South Channel percentage. Subsequent cells use flows modified by the percentage split.

Groundwater

Concentration of phosphorus assumed to be 0.126 mg/l, from Dennis Smith's (CH2M Hill) report. The flow of groundwater is assumed to be broken down into three general reaches of the river, from Lucky Peak to Glenwood Bridge, Glenwood to Middleton, and the remainder of the river to Parma. The river gains groundwater in all reaches in this model. The

estimated groundwater inflow is distributed evenly per mile across each reach. Cells J1:J3 contain the per-mile groundwater inflow, in cfs, for the three reaches. Cell K2 provides a control for the concentration of phosphorus in the groundwater.

Treatment Plants on Tributaries

The Meridian, Star, ConAgra, Nampa, Nampa Fish Hatchery, and Notus wastewater treatment plants discharge effluent to tributaries of the Boise River. The Meridian Treatment plant effluent is mixed into the Fifteenmile Creek phosphorus load, while Nampa, the Nampa Fish Hatchery, and ConAgra are mixed into Indian Creek. The ratios for Nampa, the Nampa Hatchery, and ConAgra are controlled by the Riverside Diversion, which diverts approximately 80% of the flow of Indian Creek upstream of its confluence with the Boise River. The Star treatment plant enters the Lawrence Kennedy Canal, which eventually feeds into Mill Slough. For that reason, I have assumed that the Star effluent ratio is the same as the Mill Slough ratio. The Notus treatment plant discharges very close to the mouth of Conway Gulch, giving the treatment plant the same ratio as the Gulch.

Phosphorus Concentration Calculations

Each cell calculates the concentration of total phosphorus in the Boise River using the upstream concentration, the input (or withdrawal) of phosphorus from a source, and groundwater inflow. Diversions remove water containing the phosphorus concentration of the river from the upstream cell. The concentration calculation is the standard Mixflow * Mix [TP] = river flow * river[TP] + input/output flow * input/output[TP] + groundwater flow * groundwater[TP]

Lower Boise River
Effluent Trading Location Ratios

Appendix 3A - High to Low Water Year Variation

The accompanying information provides detail on the variation that occurs within the trading ratios due to changes in flow during high and low water years. The currently accepted ratios were developed by Paul Schinke (formerly of DEQ) and are based on mass balance modeling for the Lower Boise River, given 1996 standard irrigation season conditions.

Calculation of Ratio Variation

The high and low water years used to determine the potential magnitude of variation incorporated all known inputs and diversions to the river system as previously identified. All available information on groundwater inflow and associated phosphorus load was incorporated. The existing spreadsheet (developed by Paul Schinke) which models the flow split around Eagle Island, and accounts for inputs / diversions on the North and South channels was used to assess the trading ratio values for each year.

All flow years were modeled using irrigation season conditions, April 15 to October 15. Because the completion of the Lucky Peak Dam initiated a significant change in flow management, highest and lowest water years were selected from the flows on record after construction of the Dam.

Flow values from 1983 were used for the "high" water year. This year represents the highest year on record for the designated time period (100^{th} percentile). Flow values from 1977, 1988, 1990, 1991 and 1992 were very similar, and represent the lowest water years on record for the designated time period (0^{th} percentile).

Comparison of Calculated and Monitored Average Years

An average (mean) water year was calculated from the data available from 1955 to 1998. These calculated average flows were then compared to all other flows on record. 1996 flows were observed to compare most closely with the calculated values (<10% deviation). Because of this close correlation, and the fact that certain assumptions had to be made regarding ground-water inputs for the calculated average water year, it is recommended that 1996 be accepted as the "standard" water year for ratio assessment. The data available for 1996 represent actual monitored conditions and therefore are viewed as more reliable than the calculated values.

Comparison of 1996 to High and Low Water Years

Using 1996 as a "standard" water year, the ratios generated for high and low water years were evaluated. Deviation from the 1996 ratio values varied from 0% (equal to 1996 ratios)

near Parma, to 22% in the area farthest upstream. Variation decreased with distance downstream for both point and nonpoint sources. Given the significant magnitude of the change in flow values from high to low water years (100^{th} to 0^{th} percentile range), the maximum variation in trading ratios is minimal. While the effect this variance may have on the effluent trading process should be considered by the Framework Team, it does not appear to warrant the use of water-year specific trading ratios.

Rounding Protocol

A rounding protocol was developed to compensate for differences in rounding within spreadsheet functions. Because of the fact that recorded data contained a wide range of significant figures, the accuracy of each recorded data point was maintained throughout the entire calculation process and rounding to two decimal places (hundredths) was done only in the final ratio calculation. In this manner, consistency was maintained throughout the spreadsheet and minor variations in ratios (hundredths place) could be accurately tracked. Differences of less than four thousandths (0.004) were rounded down to the nearest hundredth. Differences of greater than four thousandths (0.004) were rounded up to the nearest hundredth. Overall percent differences are displayed as integers.

Lower Boise River
Effluent Trading Location Ratios

Appendix 4A – Comparison of 1994 Calculated Ratios to 1996 Calculated Ratios

Table 3. Change of Ratios from 1994 to 1996, Percent

Source	1994 Ratio	1996 Ratio	%Change
Lander Street	**0.47**	**0.56**	**16**
West Boise	**0.44**	**0.51**	**14**
Eagle Island Fish Hatchery**	**0.67**	**0.67**	**0**
Meridian	**0.67**	**0.75**	**11**
Star	**0.67**	**0.75**	**11**
Middleton	**0.67**	**0.75**	**11**
Nampa Fish Hatchery*	**0.20**	**0.20**	**0**
ConAgra / Armour*	**0.20**	**0.20**	**0**
Nampa*	**0.20**	**0.20**	**0**
Caldwell	**0.85**	**0.89**	**4**
Notus	**0.93**	**0.95**	**2**
Eagle Drain	**0.53**	**0.63**	**16**
Thurman Drain	**0.44**	**0.51**	**14**
Fifteenmile Creek	**0.67**	**0.75**	**11**
Mill Slough	**0.67**	**0.75**	**11**
Willow Creek	**0.67**	**0.75**	**11**
Mason Slough	**0.67**	**0.75**	**11**
Mason Creek	**0.67**	**0.75**	**11**
East Hartley Gulch	**0.74**	**0.80**	**8**
West Hartley Gulch	**0.74**	**0.80**	**8**
Indian Creek	**0.85**	**0.89**	**4**
Conway Gulch	**0.93**	**0.95**	**2**
Dixie Drain	**0.94**	**0.96**	**2**

*These sources are influenced by Riverside Diversion prior to entering the Boise River

** The Eagle Hatchery load is so small (about one half of one pound) that a change in the ratio cannot be distinguished within one decimal place.

Lower Boise River
Effluent Trading Location Ratios

Appendix 5A – Catastrophic Analysis

Questions were raised during the May 12, 1999 Framework Team Meeting regarding the magnitude of an event that would result in a significant change in ratios, and lead to an unscheduled reopening of ratios. In response, two scenarios were evaluated for total impact to the flow-based phosphorus ratios.

The first scenario focussed on the salmon augmentation flows (salmon flush) within the Boise River system. Two changes were evaluated, complete cessation of salmon flush and doubled flush volume (from 1,000,000 acre-feet proposal). Neither of these scenarios was observed to result in a significant change in ratios. Both resulted in flow variations of less than 10% overall, and would therefore not necessitate an unscheduled reopening of ratios.

The second scenario focussed on changes in irrigation practices in the Boise Valley. Modeled changes showed that anything less than a 50% reduction in irrigated land (irrigation diversions and recharge flows were evaluated) would not result in a change in ratios requiring unscheduled re-evaluation. For example, total removal of the New York Canal, which represents nearly 50% of all diverted irrigation flows in the Boise Valley, would potentially require re-evaluation of ratios; anything less than this magnitude was not shown to cause sufficient variation.

Appendix C: Trade Record Keeping and Tracking

Trade Tracking and Records Management System

Inputs

Trade Notification Form

Submitted when:	Parties have agreed to trade
Submitted by:	Buyer or seller
Contains:	Names of buyer and seller / permit numbers if applicable
	Time period of trade
	Amount of Parma pounds traded
	Unique identifying number of reduction credits being transferred of reduction credits being transferred (or Reduction Credit Certificate form is attached)

Reduction Credit Certificate Form

Submitted when:	After inspection or monitoring as specified by BMP in use.
Submitted by:	Buyer/ Point Source
Contains:	Name/Address of non-permitted source
	Type and location of BMP
	Parma pounds measured or calculated

Preloaded Data

Location Ratios - Current published ratios set; updated with any revisions.

Effluent Limits – Initial permitted effluent limits supplied by Point Sources (based on the limits associated with their initial Waste Load Allocations); updated when permits are reissued with new permit limit from any changes to TMDL's WLAs.

Representatives - Names of authorized representatives of point sources.

Identifying numbers already established - e.g., permit numbers for point sources, USDA numbers for non-point sources of any other GIS-based identifiers they use, and a cross-walk for easy look-up.

Trade Tracking System Functions

Record and confirm the receipt of the Trade Notification form. Enter the information on trading parties and assign a unique identifier to the trade which designates the project type and location, buyer and seller, number of credits, and duration.

- Record and confirm the receipt of the Reduction Credit Form. Establish a unique identifier for the number of credits generated so that its location, BMP type, number of credits generated for that period, and duration can be traced back to the form and so that no NPS-generated block of credits can come into existence without a form having been completed properly and submitted. The unique identifier will be matched to the identifier on the Trade Notification Form.
- Create a code for each trading party for linking with related transactions and filing purposes.
- Track the time period for which a reduction credit certificate is valid, as determined by the BMP's monitoring requirements, or monthly, as the time period established in the program design. Mark as "invalid for transfer" those credits for which the valid time period has already passed.

- Once the data from the Reduction Credit Certificate form is entered, the data system checks the accuracy of the location ratios and delivery ratios listed on the form and the form's calculations used in determining the number of credits. If a calculation provided on the form is found to be inaccurate, the data system issues an "invalid credit certificate" notice and associates that status with the unique identifier assigned to the Reduction Credit Certificate form.
- Link the valid or invalid status of a Reduction Credit Certificate to the Trade Notification form that involves that Reduction Credit Certificate, and issue an "invalid transfer" notice and associate that status with the unique transaction number assigned to that Trade Notification form. Also issue an "invalid transfer" notice when a Trade Notification form instructs to transfer a Reduction Credit that is not in the transferor's account at the time the Trade Notification form is processed.
- Record and issue confirmations of trades between parties per submitted Trade Notification Form and Reduction Credit Form that the data system determines to be valid (i.e., the credits are in the transferor's account and are of the quantity requested to be transferred).
- Transfer credits held by transferors in the order Trade Notification Forms are received
- Provide a control method that prevents the sale of a credit to more than one buyer at one time or the "use" of a credit by a point source more than one time. "Use" of a credits means that the quantity of credits transferred to a point source's accounts equals the quantity of credits created by a specified BMP at a specified location, as documented by the Reduction Credit Certificate(s) input in the data system, and the same credits are then claimed by the point source on its DMR report to EPA .
- Record transfer of credits generated by non-point sources when authorized by a Trade Notification form on file authorizing a transfer for that month or time period and triggered by the submission of the Reduction Credit form for that month (or whatever time period is approved for that BMP).
- Determine if location ratios and delivery ratios used in the Reduction Credit Certificate are valid for the time in which the Reduction Credit Certificate is submitted.
- Provide accurate records of all transactions and make available all supporting documentation.
- Provide "search capabilities" for customized reports – e.g. the types and location of BMPs used to generate credits.
- Run reconciliation report on a monthly basis to reconcile trades reported on Trade Notification Forms and Reduction Credit Forms.
- Demonstrate compliance at all times with good data system and accounting principles with appropriate internal controls and audit trails in place.
- Perform checks on effluent trading restrictions, if any (e.g. record as "invalid trade" any trades that exceed a PS's "cap." Location-based caps are placed on the amount of credits that can be acquired by a point source or drain at a given location to prevent localized impacts.)
- Provide accurate records of all transactions involving credits in the system, including creation, sale, resale, and use.
- Opens and maintains accounts in the data system for all permitted point sources, non-point sources that submit Reduction Credit Certificates, and for other parties serving as transferor or transferee of credits. The accounts will track the contact information provided on the forms.

Outputs

Reduction Credit Certificate and Trade Confirmations

Contents: Provides notice of receipt to parties and confirms information received and submitted in the system. Provides confirmation that a trade was "valid" and recorded.

Frequency: Sent immediately after Trade Notification Form and Reduction Credit Form are entered.

Recipient: Trading parties.

Monthly Trade Summary

Contents: Reports all trades on file for the month by parties. Provides a monthly confirmation to trading parties. Displays only trades that are valid and recorded, involving credits that can be used in that time period. To be used by permitted parties in DMR reporting to EPA.
Frequency: Monthly
Recipient: Trading parties.

Exception Report

Contents: Sent to the parties when the system shows an "invalid credit" from a submitted Reduction Credit Certificate that calculated the quantity of credits incorrectly, or for an "invalid trade" for a Trade Notification Form in which they were a transferor or transferee, in which the trade could not be processed because of the "invalid credit" status of the credits listed on the form or the failure of the credits listed on the form to be in the transferor's account at the time the trade was processed. The notice will state the reason for the failure.
Frequency: Triggered by event.
Recipient: Trading parties.

Annual Summary Report

Contents: Sent to all parties to summarize trading activity for the year.
Frequency: Annual
Recipients: All parties with current accounts in the system.

Other Customized Reports

Contents: Provides information from the database that is not on a standard report. Information could be sorted by river mile, BMP or permitted vs non-permitted.
Frequency: Adhoc
Recipients: Available to trading parties, EPA, DEQ and general public for a processing fee.

Records Management System

Entities are required to retain records on site for a five year period after the completion of the contract. This time period matches the record retention period required in the NPDES permit.

Trading Parties

Copy of the Reduction Credit Form
Copy of the Trade Notification Form
Copies of Monitoring Data

Association

Original Reduction Credit Form
Original Trade Notification Form
Database Information / Reports

EPA

DMRs with attached Monthly Trade Summary
Annual Summary Report

DRAFT - 09/18/2000

Lower Boise River Effluent Trading Program

DATE RECEIVED:

– TRADE NOTIFICATION FORM –

(To Be Completed By Association)

– TO BE COMPLETED BY THE BUYER –

NAME OF BUYER (POTW OR COMPANY)

PERMIT NUMBER

NAME OF AUTHORIZED REPRESENTATIVE (OF BUYER)

PHONE NUMBER

– TO BE COMPLETED BY THE SELLER –

NAME OF SELLER

SELLER'S PERMIT NUMBER (IF APPLICABLE)

NAME OF AUTHORIZED REPRESENTATIVE (OF SELLER)

PHONE NUMBER

– TO BE COMPLETED BY EITHER PARTY –

AMOUNT OF PHOSPHOROUS TRADED (PARMA POUNDS): _____ LBS./DAY FOR:

A) The Month of _____ (if purchasing verified credits from a Non-Permitted Source, provide BMP Identifier: _____)

OR

B) _____(month/year) to _____(month/year), to create an automatic transfer from the Seller's account to the Buyer's account, upon the recording of a valid Reduction Credit Certificate for that amount in the Trade Registry by __ days after the end of the month *(Credit Transfer Deadline to be determined).*

DRAFT - 9/18/2000

Lower Boise River Effluent Trading Program

– REDUCTION CREDIT CERTIFICATE –

VALID FOR REDUCTION ACTIVITY FOR MONTH(S) OF _____ YEAR _____

NAME OF NON-PERMITTED SOURCE

CONTACT NAME

ADDRESS

PHONE NUMBER

BEST MANAGEMENT PRACTICE (BMP) IDENTIFIER:

– Type of BMP:

– Location of BMP:

MONITORING METHOD

MONITORING FREQUENCY

MONITORING RESULTS (LOCAL POUNDS)

PARMA POUNDS (AMOUNT OF MARKETABLE CREDITS):

Total Reduction Amount in Local Pounds _____

subtract **Water Quality Contribution*** amount _____ = _____
(*TMDL determines what this amount or calculation is)

multiply by **River Location Ratio** _____ = _____ (tradable credit amount in Parma Pounds if next two factors are not applicable)

(if applicable) *multiply by* **Drainage Delivery Ratio** _____ = _____ (tradable credit amount in Parma Pounds if next factor is not applicable)

(if applicable) *multiply by* **Site Location Factor** _____ = _____ (tradable credit amount in Parma Pounds)

CERTIFICATION:

This form has been prepared for the purpose of submitting the information contained in it to the U.S. Environmental Protection Agency.

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I further certify that I am authorized to bind the party on behalf of which I am signing to the terms of this document. I further certify that the BMP, the monitoring, and the credit calculation described above satisfies the requirements for that type of BMP as set forth in the BMP list. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. See 18 U.S.C. § 1001 and 33 U.S.C. § 1319. *(Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)*

SIGNATURE OF PERMITTED SOURCE BUYER OR NON-PERMITTED SOURCE BUYER:

_____ ***DATE:*** _____

CERTIFICATION: *(Not the exact words to be used, but the concept - the trading rules and permit would need to spell this out more clearly as well)*

This form has been prepared for the purpose of submitting the information contained in it to the U.S. Environmental Protection Agency.

FOR PERMITTED SOURCE BUYER:

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I further certify that I am authorized to bind the party on behalf of which I am signing to the terms of this document. I acknowledge that the transfer of credits specified in this document is contingent on the generation of the underlying credits, and my certification of those credits by a Reduction Credit Certificate corresponding to the BMP identified above and the applicable monitoring period. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. See 18 U.S.C. § 1001 and 33 U.S.C. § 1319. *(Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)*

I understand that the amount of credits to be transferred by this form is determined initially by the amount established in the first completed Reduction Credit Certificate that is received by the Trade Tracking System for the BMP identified for that month, and then by the amount specified by the Trade Notification Form, up to the amount of credits remaining in the actual BMP credit calculation. I understand that the order in which a Trade Notification Form is processed when multiple Trade Notification Forms are received that request to transfer credits from a single seller's account is determined by the order in which they were received for recording by the Trade Tracking System.

SIGNATURE OF PERMITTED SOURCE BUYER:_____ DATE: _____

FOR NON-PERMITTED SOURCE SELLER WHO OWNS OR IS THE LESSEE OF THE PROPERTY ON WHICH THE ABOVE REFERENCED BMP IS LOCATED:

I hereby transfer all or part of the credit from BMP Identifier _____, for the time period specified in this document, to the Buyer identified in this document. I hereby grant permission to access the BMP described above at reasonable times to the NPDES permit holder purchasing this credit and the Idaho Soil Conservation Commission for the exclusive purpose of verifying the information contained in this document and in any Reduction Credit Certificate pertaining to the BMP described above. All information collected or received during or pursuant to such access to the BMP shall be used solely for purposes of regulatory compliance of the NPDES permit holder and not for any other purpose whatsoever. Such access shall extend to the Idaho Department of Environmental Quality and the U.S. Environmental Protection Agency to the extent set forth in the Memorandum of Agreement, dated *xx/xx/xxxxx* .

I understand that the amount of credits to be transferred by this form is determined initially by the amount established in the first completed Reduction Credit Certificate that is received by the Trade Tracking System for that BMP for that month, and then by the amount specified by the Trade Notification Form, up to the amount of credits remaining in the seller's account. I understand that the order in which a Trade Notification Form is processed when multiple Trade Notification Forms are received that request to transfer credits from a single seller's account is determined by the order in which they were received for recording by the Trade Tracking System.

SIGNATURE OF SELLER:_____ DATE: _____

SELLER OF NONPOINT SOURCE REDUCTION BY OTHER THAN A POINT SOURCE OR THE NONPOINT SOURCE INVOLVED IN THE BMP:

I hereby transfer all or part of the credit from BMP Identifier _____, for the time period specified in this document, to the Buyer identified in this document. I understand that the amount of credits to be transferred by this form is determined initially by the amount established in the first completed Reduction Credit Certificate that is received by the Trade Tracking System for that BMP for that month, and then by the amount specified by the Trade Notification Form, up to the amount of credits remaining in the seller's account. I understand that the order in which a Trade Notification Form is processed when multiple Trade Notification Forms are received that request to transfer credits from a single seller's account is determined by the order in which they were received for recording by the Trade Tracking System.

SIGNATURE OF SELLER:_____ DATE: _____

FOR PERMITTED SOURCE SELLER:

I hereby reduce the phosphorus discharge allowance under the TMDL and under NPDES Permit Number _____ by the amount identified in this document. .

SIGNATURE OF SELLER:_____ DATE: _____

CERTIFICATION:

This form has been prepared for the purpose of submitting the information contained in it to the U.S. Environmental Protection Agency.

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I further certify that I am authorized to bind the party on behalf of which I am signing to the terms of this document. I further certify that the BMP, the monitoring, and the credit calculation described above satisfies the requirements for that type of BMP as set forth in the BMP list. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. See 18 U.S.C. § 1001 and 33 U.S.C. § 1319. *(Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)*

SIGNATURE OF PERMITTED SOURCE BUYER OR NON-PERMITTED SOURCE BUYER:

_____ ***DATE:*** _____

DRAFT
09/18/00

DISCHARGE MONITORING REPORT (DMR)

Reporting and Tracking Trades on DMRs and in the Permit Compliance System (PCS)

I. DMRs:

1A	Parameter	Effluent	*[actual measured P discharge]*
1B	Limit		Reporting Only
2A	Parameter	Credits	*[amount of credits purchased]*
2B	Limit		Reporting Only
3A	Parameter	Debits	*[amount of credits sold]*
3B	Limit		Reporting Only
4A	Parameter	Ratio	*[ratio]*
4B	Limit		Reporting Only
5A	Parameter	Adjusted Discharge	*[discharge adjusted by trades -- 1A - [(2A-3A)/4A]*
5B	Limit		[Unadjusted base permit limit]

Items in italics are what the permittee reports on the form. Everything else is preprinted on the form. The bottom row (5A/5B) is what PCS will use for the compliance determination. Rows 2 and 3 would be in "Parma Pounds", and rows 1 and 5 would be in real pounds measured at the outfall.

II. Supporting Documentation Submitted with DMR:

A. Table from Association Showing Trades (all in "Parma Pounds"):

August 2001	PS1 buy	PS2 buy	PS3 buy	PS4 buy	Bank buy	Total Sales	
PS1 sell		4	1			5	
PS2 sell			2			2	
PS3 sell						0	
PS4 sell		11	4			15	Total PS sales = 22
Bank sell							
NPS1 sell		5		5		10	
NPS2 sell			1			1	
NPS3 sell		5	2			7	Total NPS sales = 18
Total Purchases	0	25	10	5			Total purchases = 40

In this example:
PS1: small seller -- sells 5, buys 0
PS2: big buyer, but also makes small sale -- sells 2, buys 25 (15 PS + 10 NPS)
PS3: small buyer -- sells 0, buys 10 (7 PS + 3 NPS)
PS4: big seller, but also buys a BMP credit -- sells 15, buys 5
NPS1: sells 10 (5 + 5)
NPS2: sells 1
NPS3: sells 7 (5 + 2)

B. Additional Documentation to support the validity of trades to be retained by the Association:
- PS-PS trades: Trade Notification Form
- PS-NPS trades: Reduction Credit Certificate; Trade Notification Form

C. Additional Documentation to support the validity of trades to be retained by the NPDES permit holder:
- PS-PS trades: Trade Notification Form
- PS-NPS trades: Reduction Credit Certificate; Trade Notification Form; supporting documentation regarding BMP inspections and monitoring of BMP installation, maintenance, and effectiveness.

Appendix D: Model Trade Information

DESCRIPTION OF THE PS-PS MODEL TRADE

9/18/00 DRAFT: For Demonstration Purposes Only

("Parma Pounds" are used unless specified otherwise, all numbers and dates used in the example are hypothetical)

Boise and Middleton are both required to meet phosphorous effluent limits from April 15 through October 15 each year.

1. *Jan 1:* The City of Middleton determines that it needs 6.67 pounds per day of phosphorus to meet its effluent limit. Middleton asks for proposals (RFP) for delivering 5.0 **Parma pounds** (6.67 lb/day X .75, Middleton's **location ratio**) of P/irrigation season for the next 5 years, to begin April 15 of the same year. The irrigation season is defined as April 15 - October 15.

2. *Feb. 1:* City of Boise responds to Middleton's request, and offers to produce 8.9 **local pounds** from the Lander Street treatment plant, which equals 5.0 Parma pounds (8.9 lb/day x 0.56, Lander Street's location ratio), using excess treatment capacity they have in their system due to significant investments in technology and capacity for future growth.

3. *Feb. 10-20*: Middleton likes the offered terms and they negotiate an agreement [Memorandum of Understanding] with Boise, specifying the exact delivery date and payment terms for the reduction credits.

4. *April 1:* Boise and Middleton complete a **Trade Notification form** which documents the transfer of reduction credits from Boise's account to Middleton's account, and submits it to the official trade registry.

   When recorded, the trade registry reflects a decrease of credits in terms of Parma pounds in Boise's account, beginning in April, and a corresponding increase of credits in Middleton's account, beginning in April, based on the Trade Notification form.

   Middleton and Boise receive written confirmation from the Trade Registry of the successful recording of the transaction.

5. *April, and for each month thereafter:* Boise and Middleton conduct routine monitoring as required under the terms of their permits.

6. *On or before May 15 (and for every month thereafter, through December of each year, for the duration of the program):* As the seller, Boise reports on line 3A of its **Discharge**

Monitoring Report (DMR)[1] for July that it sold 5.0 credits in a recorded trade. It then calculates its adjusted discharge by dividing the credits reported sold on line 3A by its location ratio of .56 and adding the result to its actual discharge reported on line 1A, to achieve its adjusted discharge number, which can then be compared with its unadjusted base permit limit to determine its compliance status. If it is below the limit, it is in compliance, but if it is above the limit, then Boise is subject to enforcement action according to the NPDES regulations. Boise submits a copy of the Association trade summary report with its DMR for verification of the trades.

As the buyer, Middleton reports on line 3A of its **Discharge Monitoring Report** (DMR) for July that it purchased 5.0 credits in a recorded trade. It then calculates its adjusted discharge by dividing the credits reported purchased on line 2A by its location ratio of .75 and subtracting the result from its actual discharge reported on line 1A. Its adjusted discharge can then be compared with its base permit limit to determine its compliance status. If it is below the limit, it is in compliance, but if it is above limit, then Middleton is subject to enforcement action according to the NPDES regulations. Middleton submits a copy of the Association trade summary report with its DMR for verification of the trades.

[1] This example assumes the DMR is submitted monthly because it assumes the TMDL's limit will require a monthly compliance and reporting period, but the TMDL's limit could be written to require a different compliance and reporting period.

MODEL AGREEMENT FOR WASTELOAD ALLOCATION TRANSFER

DRAFT: For Demonstration Purposes Only 09/18/00

THIS AGREEMENT is made this first day of January, 1999, between the CITY of MIDDLETON (Middleton) and the CITY OF BOISE CITY (Boise).

WHEREAS, Middleton and Boise operate wastewater treatment facilities within the Lower Boise River Watershed, and;

WHEREAS, the Lower Boise River Total Maximum Daily Load (Lower Boise TMDL), was approved by EPA on _____ and has been incorporated in part, in the state water quality management plan, and;

WHEREAS, the TMDL incorporates a seasonal no net increase approach for total phosphorus, and allocates a seasonal total phosphorus load of X pounds per day to Middleton and X pounds per day to Boise and ;

WHEREAS, trading is encouraged as a tool to address TMDLs in state water quality standards (IDAPA 16.01.02.054) and trading rules have been established in state water quality management plan provide for trades between wastewater treatment facilities to accommodate development while satisfying water quality issues contained in the Lower Boise TMDL, and ;

WHEREAS, Boise has achieved reductions in total phosphorus discharges from the baseline conditions contained in the TMDL and can sell total phosphorus credits to Middleton, and;

WHEREAS, Middleton must obtain additional total phosphorus wasteload allocation or provide a higher level of treatment to satisfy the conditions of the Lower Boise TMDL;

WHEREAS, Middleton and Boise desire to implement the water quality trade within the Lower Boise watershed, whereby point source to point source transfers may be completed, and;

WHEREAS, Middleton and Boise desire to enter into this Agreement, whereby Boise agrees to an interim transfer of portion of its total phosphorus wasteload allocation to Middleton, subject to the terms and conditions of this Agreement.

NOW, THEREFORE, Middleton and Boise agree as follows:

1. ALLOCATION TRANSFER

Boise hereby transfers to Middleton five (5) Parma Pounds per day of Boise's seasonal total phosphorus wasteload allocation (Transferred Allocation), subject to the terms and conditions of this Agreement.

2. RETURN OF Boise's Transferred ALLOCATION

Middleton agrees to use its best efforts to secure its own phosphorus wasteload allocation through multiple mechanisms, including but not limited to: (1) point source to point source transfers, (2) nonpoint source to point source trades, (3) phosphorus concentration reductions through alternative treatment, or (4) a new wasteload allocation. Middleton agrees to use its best efforts to secure a phosphorus allocation equivalent to five (5) Parma Pounds per day or such greater total phosphorus wasteload allocation required for compliance with Middleton's no net increase baseline allocation contained in the Lower Boise TMDL.

3. COMPENSATION

Middleton agrees to pay certain compensation to Boise in connection with the trade.

Middleton agrees to pay Boise $X.00/lb/day or ($X,XXX annually) for 5 pounds total phosphorus per day. Additional effluent monitoring at the Middleton WWTF that may be required associated with this trade is solely the responsibility of Middleton.

4. MEMBERSHIP

Middleton and Boise agree to become and remain members of the Idaho Clean Water Cooperative for the duration of the term of this Agreement.

5. REALLOCATIONS

If during the term of this Agreement, the phosphorus wasteload allocations in the Lower Boise TMDL are reallocated, Boise shall support the allocation of five (5) pounds per day of total phosphorus to Middleton by, *inter alia*, voting affirmatively for the allocation, signing letters endorsing the allocation, and appearing at relevant meetings in support of the allocation. Boise shall not use this Agreement as a basis for objecting to an allocation to Middleton of at least five (5) pounds per day, or such greater amounts as may be determined to be necessary for Middleton's compliance with this Agreement.

6. REGULATORY AMENDMENTS

Both parties agree to support -- by, *inter alia*, voting affirmatively, signing endorsement letters, and appearing at relevant meetings -- modifications to the Control Regulation to provide for transfers of phosphorus allocations and concentrations, and development of a trading program in the Lower Boise Watershed.

7. ASSIGNMENTS

Neither party to this Agreement shall assign, subcontract, or otherwise transfer its rights or obligations under this Agreement without prior written consent of the other party, which shall not be unreasonably withheld. For the purposes of this Agreement, Boise hereby consents to

Middleton's assignment of the Agreement to any of the following entities: any water and wastewater special district, any existing wastewater treatment facility or district within the Lower Boise watershed, or any other local governmental entity that assumes primary responsibility for wastewater treatment within the Lower Boise River watershed.

8. AGREEMENT TERM

This Agreement shall have a term of five (5) years, with the option of three (5) year renewals. Middleton must request the renewals by December 1 of the fourth year of this Agreement for the first renewal, and December 1 of the ninth and fourteenth years of this Agreement, provided the Agreement has been previously renewed. Boise has sixty (60) days to confirm the renewal. Boise can refuse to renew if Boise needs, or expects to need within the period of the requested renewal, the total phosphorus allocation to provide wastewater treatment within its service area. If Middleton does not request renewal or Boise denies any renewals, this Agreement shall terminate upon the expiration of that term.

9. TERMINATION

This Agreement may be terminated prior to the expiration of the Agreement term or prior to the expiration of any succeeding renewal terms, as follows:

a. By mutual consent of both parties;

b. By Middleton, if regulatory modifications or any other circumstances render, in the opinion of Middleton, the Agreement unnecessary; or,

c. By Boise, if regulatory changes or any other circumstance reduce Roxborough's allocation of wasteload credits at any time during the term of this Agreement.

1 NOTICE

For the purposes of this Agreement, all notices, Reports, inquiries, and other correspondence related to this Agreement shall be given to the parties with copies to their legal counsel and engineers as follows:

Boise:	Richard Dees, Operations Manager	
With copies to Engineers:	Carl Ellsworth, P.E. Boise City Public Works150 N Capitol Boise, ID 83701	
Legal Counsel:	Doug Strickling, Esq.	
	Office	Boise City Attorney's Boise, ID 83701
Middleton:	Bob Schmillen Middleton WWTF Address Middleton, ID 83XXX	
	With copies to	
Engineers:	Mike Holladay, P.E.Holladay Engineering Co.	
And	Some Lawyer, Esq.	
Legal Counsel:	Attorneys R US, L.L.P.M Street, Suite 0Anywhere ID 83000	

Notice shall be transmitted by depositing the notice with prepaid postage in the U.S. Mail or with a courier. Either party may, from time to time, change the name and/or the addresses of the persons to receive notice.

2. CHANGES AND AMENDMENTS

No changes or modifications to this Agreement shall be valid unless they are made in writing and signed by both Boise and Middleton.

3. ENTIRE AGREEMENT

This Agreement constitutes the entire agreement between the parties, and supersedes all prior agreements or understandings, whether oral or in writing, between Boise and Middleton.

4. APPLICABLE LAW

This Agreement shall be subject to and governed by the laws of the State of Idaho.

5. LEGAL REQUIREMENTS

This Agreement and the rights and duties established herein shall be subject to any and all applicable federal, state or local legal requirements, including any necessary governmental approvals.

6. SEVERABILITY

If any provision of this Agreement is adjudged by any court of law to be void or unenforceable, in whole or in part, such adjudication shall not be deemed to affect the validity of the remainder of the Agreement. Each provision of this Agreement is declared to be separable from every other provision and constitutes a separate and distinct covenant.

7. HEADINGS

The headings in this Agreement are provided for convenience only and shall not be considered when interpreting any of the provisions of terms of this Agreement.

8. EFFECTIVE DATE

This Agreement shall be effective _____, 1999.

Boise City By:

Title

Middleton By: Title

DRAFT - 09/18/2000

Lower Boise River Effluent Trading Program

DATE RECEIVED:

– TRADE NOTIFICATION FORM –

(To Be Completed By Association)

– TO BE COMPLETED BY THE BUYER –

NAME OF BUYER (POTW OR COMPANY) CITY OF MIDDLETON

PERMIT NUMBER XXXX

NAME OF AUTHORIZED REPRESENTATIVE (OF BUYER) BOB SCHMILLEN

PHONE NUMBER

– TO BE COMPLETED BY THE SELLER –

NAME OF SELLER CITY OF BOISE

SELLER'S PERMIT NUMBER (IF APPLICABLE) YYYY

NAME OF AUTHORIZED REPRESENTATIVE (OF SELLER) RICHARD DEES, OPERATIONS MANAGER

PHONE NUMBER

– TO BE COMPLETED BY EITHER PARTY –

AMOUNT OF PHOSPHOROUS TRADED (PARMA POUNDS): 5.0 **LBS./DAY FOR:**

A) The Month of _____ (if purchasing verified credits from a Non-Permitted Source, provide BMP Identifier: _____)

OR

B) 4/00 (month/year) to 10/00 (month/year), to create an automatic transfer from the Seller's account to the Buyer's account, upon the recording of a valid Reduction Credit Certificate for that amount in the Trade Registry by __ days after the end of the month *(Credit Transfer Deadline to be determined).*

CERTIFICATION: *(Not the exact words to be used, but the concept - the trading rules and permit would need to spell this out more clearly as well)*

This form has been prepared for the purpose of submitting the information contained in it to the U.S. Environmental Protection Agency.

FOR PERMITTED SOURCE BUYER:

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I further certify that I am authorized to bind the party on behalf of which I am signing to the terms of this document. I acknowledge that the transfer of credits specified in this document is contingent on the generation of the underlying credits, and my certification of those credits by a Reduction Credit Certificate corresponding to the BMP identified above and the applicable monitoring period. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. See 18 U.S.C. § 1001 and 33 U.S.C. § 1319. *(Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)*

I understand that the amount of credits to be transferred by this form is determined initially by the amount established in the first completed Reduction Credit Certificate that is received by the Trade Tracking System for the BMP identified for that month, and then by the amount specified by the Trade Notification Form, up to the amount of credits remaining in the actual BMP credit calculation. I understand that the order in which a Trade Notification Form is processed when multiple Trade Notification Forms are received that request to transfer credits from a single seller's account is determined by the order in which they were received for recording by the Trade Tracking System.

SIGNATURE OF PERMITTED SOURCE BUYER: Sample for Model Trade DATE: _____

FOR NON-PERMITTED SOURCE SELLER WHO OWNS OR IS THE LESSEE OF THE PROPERTY ON WHICH THE ABOVE REFERENCED BMP IS LOCATED:

I hereby transfer all or part of the credit from BMP Identifier _____, for the time period specified in this document, to the Buyer identified in this document. I hereby grant permission to access the BMP described above at reasonable times to the NPDES permit holder purchasing this credit and the Idaho Soil Conservation Commission for the exclusive purpose of verifying the information contained in this document and in any Reduction Credit Certificate pertaining to the BMP described above. All information collected or received during or pursuant to such access to the BMP shall be used solely for purposes of regulatory compliance of the NPDES permit holder and not for any other purpose whatsoever. Such access shall extend to the Idaho Department of Environmental Quality and the U.S. Environmental Protection Agency to the extent set forth in the Memorandum of Agreement, dated *xx/xx/xxxxx* .

I understand that the amount of credits to be transferred by this form is determined initially by the amount established in the first completed Reduction Credit Certificate that is received by the Trade Tracking System for that BMP for that month, and then by the amount specified by the Trade Notification Form, up to the amount of credits remaining in the seller's account. I understand that the order in which a Trade Notification Form is processed when multiple Trade Notification Forms are received that request to transfer credits from a single seller's account is determined by the order in which they were received for recording by the Trade Tracking System.

SIGNATURE OF SELLER: Sample for Model Trade DATE: _____

SELLER OF NONPOINT SOURCE REDUCTION BY OTHER THAN A POINT SOURCE OR THE NONPOINT SOURCE INVOLVED IN THE BMP:

I hereby transfer all or part of the credit from BMP Identifier _____, for the time period specified in this document, to the Buyer identified in this document. I understand that the amount of credits to be transferred by this form is determined initially by the amount established in the first completed Reduction Credit Certificate that is received by the Trade Tracking System for that BMP for that month, and then by the amount specified by the Trade Notification Form, up to the amount of credits remaining in the seller's account. I understand that the order in which a Trade Notification Form is processed when multiple Trade Notification Forms are received that request to transfer credits from a single seller's account is determined by the order in which they were received for recording by the Trade Tracking System.

SIGNATURE OF SELLER: Sample for Model Trade DATE: _____

FOR PERMITTED SOURCE SELLER:

I hereby reduce the phosphorus discharge allowance under the TMDL and under NPDES Permit Number **YYYY** by the amount identified in this document.

SIGNATURE OF SELLER: Sample for Model Trade DATE: _____

City of Middleton

DRAFT 09/18/00

SAMPLE DISCHARGE MONITORING REPORT (DMR)1

Reporting and Tracking Trades on DMRs and in PCS

I. DMRs:

1A	Parameter	Effluent	*[actual measured P discharge]*
1B	Limit		Reporting Only
2A	Parameter	Credits	***5.0***
2B	Limit		Reporting Only
3A	Parameter	Debits	*0*
3B	Limit		Reporting Only
4A	Parameter	Ratio	*.75*
4B	Limit		Reporting Only
5A	Parameter	Adjusted Discharge	*6.67* xx – [(5.0 – 0)/.75] = xx + 6.67
5B	Limit		[Unadjusted base permit limit]

Items in italics are what the permittee reports on the form. Everything else is preprinted on the form. The bottom row (5A/5B) is what PCS will use for the compliance determination. Rows 2 and 3 would be in "Parma Pounds", and rows 1 and 5 would be in real pounds measured at the outfall.

City of Boise

SAMPLE DISCHARGE MONITORING REPORT (DMR)

Reporting and Tracking Trades on DMRs and in PCS

I. DMRs:

1A	Parameter	Effluent	*[actual measured P discharge]*
1B	Limit		Reporting Only
2A	Parameter	Credits	*0*
2B	Limit		Reporting Only
3A	Parameter	Debits	***5.0***
3B	Limit		Reporting Only
4A	Parameter	Ratio	*.56*
4B	Limit		Reporting Only
5A	Parameter	Adjusted Discharge	*8.9* yy – [(0 – 5.0)/.56] = yy – 8.9
5B	Limit		[Unadjusted base permit limit]

Items in italics are what the permittee reports on the form. Everything else is preprinted on the form. The bottom row (5A/5B) is what PCS will use for the compliance determination. Rows 2 and 3 would be in "Parma Pounds", and rows 1 and 5 would be in real pounds measured at the outfall.

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1 The real DMRs will include detailed instructions on how to complete the form.

DESCRIPTION OF THE PS-NPS MODEL TRADE

9/18/00 DRAFT: For Demonstration Purposes Only

("Parma Pounds" are used unless specified otherwise, all numbers and dates used in the example are hypothetical)

Boise is required to meet phosphorous effluent limits from April 15 through October 15 each year.

1. *Jan 1:* Boise asks for proposals (RFP) for delivering 14.7 **local pounds per day**, which equals 7.5 **Parma pounds per day** (14.7 x .51, Boise's West Boise Street **location ratio**) of P/irrigation season for the next 10 years, to begin in July of next year. The credits will be purchased to adjust the effluent limit of Boise's West Boise treatment plant. The irrigation season is specified as April 15 - October 15.

2. *Feb 1:* Pioneer Irrigation District responds to Boise's request, and offers to produce 10 **local pounds per day**, which equals 7.5 **Parma pounds per day** (10 x 0.75, Pioneer's **location ratio**), using a combined BMP of a sediment pond and wetland, according to the design specifications on the **BMP List,** and indicating that the sediment pond/wetland will be measured.

3. *Feb 1:* Pioneer Irrigation District responds to Boise's request, and offers to produce 10 **local pounds per day**, which equals 7.5 **Parma pounds per day** (10 x 0.75, Pioneer's **location ratio**), using a combined BMP of a sediment pond and wetland, according to the design specifications on the **BMP List,** and indicating that the sediment pond/wetland will be measured.

4. *March- June:* Pioneer builds the sediment pond and wetland and Boise confirms to its satisfaction the proper design and construction of the BMP.

5. *July 31:* The first of the monthly **Reduction Credit Certificate** forms is completed. The form is filled out for each month that credits are being generated and submitted to the Association. The form certifies the BMP was installed correctly and is being maintained and monitored properly, according to the specifications in the BMP List. Since Pioneer is using a measured BMP, the monitoring is conducted using properly located monitors and appropriate sampling frequency, to determine the amount of credit to be reported on the

monthly Reduction Credit Certificate.[1, 2] Boise, as buyer, signs the form, which certifies their assumption of responsibility for the validity of information provided on the form and their compliance with the effluent trading program requirements

6. *Aug. 10* Boise sends to the Association a completed **Trade Notification form** along with the completed Reduction Credit Certificate form so that the trade can be recorded by the Association.

   When recorded, the trade first establishes the reduction credit of 10 Parma pounds per day in Pioneer's account, based on the Reduction Credit Certificate. It then records the increase to Boise's account and the corresponding decrease to Pioneer's account, based on the Trade Notification form. If Pioneer creates more credits than they agreed to transfer to Boise, the remaining pounds of credits would stay in Pioneer's account as a positive balance and would be available to sell to another buyer.

   Boise and Pioneer receive written confirmation from the Association of the successful recording of the transaction.

7. *On or before Sep. 15 (and for every month thereafter for the duration of the contract):* Boise calculates its adjusted discharge on its **Discharge Monitoring Report** (DMR)[3] for the applicable month by subtracting the credits reported purchased on line 2A, actual discharge minus credits purchased, or actual discharge plus credits sold; divided by its location ratio of 0.51, to its actual discharge reported on line 1A. Its adjusted discharge can then be compared with its unadjusted base permit limit to determine its compliance status. If it is below the limit, it is in compliance, but if it is above limit, then Boise is subject to enforcement action according to the NPDES regulations. Boise submits a copy of the Association trade summary report with its DMR for verification of the trades.

8. *During Sep. and each month for the duration of the contract:* Pioneer and/or Boise conduct periodic on-site monitoring as agreed to in their contract, and complete the Reduction Credit Certificate form for each monitoring period, which Boise submits with its monthly Trade Notification form (or relies on the standing order submitted to the Association to execute a monthly transfer from Pioneer to Boise for the life of the private contract).

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[1] If Pioneer had used a calculated BMP, then the amount of P credit they would generate would be calculated using the BMP's formula and an **uncertainty discount** applied to reflect the overall uncertainty with the calculation's accuracy in reflecting the actual performance of the BMP. Monitoring is then conducted on the maintenance of the BMP to ensure the conditions upon which the credit calculation is based are still present.

[2] If an individual farmer upstream from the mouth of the drain was the seller rather than Pioneer Irrigation District, then the farmer would also apply a **delivery ratio** to the number of pounds available for sale, as indicated on the Reduction Credit Certificate.

[3] This example assumes the DMR is submitted monthly because it assumes the TMDL's limit will require a monthly compliance and reporting period, but the TMDL's limit could be written to require a different compliance and reporting period.

City of Boise

DRAFT, 09/18/00

SAMPLE DISCHARGE MONITORING REPORT (DMR)[1]

Reporting and Tracking Trades on DMRs and in PCS

I. DMRs:

1A	Parameter	Effluent	*[actual measured P discharge]*
1B	Limit		Reporting Only
2A	Parameter	Credits	*7.5*
2B	Limit		Reporting Only
3A	Parameter	Debits	*0*
3B	Limit		Reporting Only
4A	Parameter	Ratio	*.51*
4B	Limit		Reporting Only
5A	Parameter	Adjusted Discharge	*14.7* xx – [(7.5 – 0)/.51] = xx – 14.7
5B	Limit		[Unadjusted base permit limit]

Items in italics are what the permittee reports on the form. Everything else is preprinted on the form. The bottom row (5A/5B) is what PCS will use for the compliance determination. Rows 2 and 3 would be in "Parma Pounds", and rows 1 and 5 would be in real pounds measured at the outfall.

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[1] The real DMRs will include detailed instructions on how to complete the form.

Mason Creek Wetland BMP
Proposed Monitoring Plan
September 18, 2000

Draft: For Demonstration Purposes Only

	Monthly	Seasonal
1. Parameters	a. Total Phosphorus, b. Flow c. Additional recommended parameters: TSS, OP as operational data (i.e. not required reportable data)	a. Total Phosphorus, b. Flow c. Additional recommended parameters: TSS, OP as operational data (i.e. not required reportable data)
2. Frequency	Total P: 2/month Flow: 5/week	Total P: 1/month Flow: 5/week
3. Locations	Influent and Effluent	Influent and Effluent
4. Sample Type	Total P: Grab Flow: Instantaneous	Total P: Grab Flow: Instantaneous
5. Methods	40CFR136/Standard Methods	40CFR136/Standard Methods
6. Quality Control	Document QA/QC; assume 20% level of effort	Document QA/QC; assume 20% level of effort
7. Annual Costs (April 15-Oct 15)		
Flow Monitoring ($15/d)	1,800	1,800
WQ Sampling (2 hr/event)	630	315
Laboratory (City)	520	260
	$2,950	$2,375

LOWER BOISE RIVER EFFLUENT TRADING DEMONSTRATION PROJECT

Draft Permit Outline for PS-PS Upstream Trades

09/18/00

This example is for a point source discharger that is buying phosphorus credits from another point source discharger located on the same river, and upstream of its facility.

AUTHORIZATION TO TRADE

The permittee is authorized to trade pursuant to the requirement in _____ (the document that the trading language is housed in), and the conditions contained within this section of the permit.

POINT SOURCE BASE EFFLUENT LIMITATIONS

Base Phosphorus Effluent Limit. The NPDES permit will contain an average monthly and an average weekly base phosphorus effluent limit. (The base limits will be derived from the wasteload allocation contained in the TMDL for the Lower Boise River and its tributaries).

PHOSPHOROUS DISCHARGE REDUCTIONS, CREDITS AND INCREASES

Voluntary Reductions of Permittee's Phosphorous Effluent Limit, and Generation of Credit. The Permittee may voluntarily reduce its base phosphorous effluent limit by a particular amount for a particular calendar month. *This creates a "credit" that may be transferred to another party downstream of its facility.*

Voluntary Reductions of Other Point Source's Phosphorous Effluent Limit, and Generation of Credit. *A point source that is an NPDES permittee, and is located upstream from the permittee, may voluntarily reduce its base phosphorous effluent limit by a particular amount for particular calendar month.* This creates a "credit" that may be transferred to this Permittee.

Increase of Point Source Effluent Limit by Receiving Transferred Credit. The permittee may increase its phosphorous effluent limit by receiving the transfer of a credit, *generated by a point source that is an NPDES permittee discharging upstream of the permittee's outfall.*

AMOUNTS OF REDUCTIONS, CREDITS AND INCREASES

Reduction Amount -- Point Sources. The amount of a point source's reduction is the amount by which the point source voluntarily reduces its phosphorous effluent limit below its base effluent limit for a given

calendar month.

River Location Ratios for Sources. Each source, including the permittee, is subject to a particular river location ratio. River location ratios will be contained in _____ [and an appendix to the permit], and subject to that document's notice, comment, review, and approval requirements. The permittee's river location ratio is ___.

Credit Amount ("Parma Pounds"). The amount of the transferrable credit that arises from a point source reduction is expressed in terms of "Parma Pounds", and is determined by multiplying the amount of the reduction by the source's location ratio.

Effluent Limit Increase Amount. If a credit is transferred to the permittee, then the amount by which the permittee's phosphorous effluent limit increases is the amount of the credit (in Parma Pounds) divided by the permittee's location ratio.

TIMING OF REDUCTIONS, CREDITS AND INCREASES

Time Period of Credit Based on Point Source Reduction. In the case of a credit based on an effluent limit reduction by another permitted point source, the time period associated with the credit is the calendar month(s) of the other point source's effluent limit reduction.

Effective Time Period of Effluent Limit Increase Resulting from Trade. If a credit is transferred to the Permittee, the resulting increase in the Permittee's base phosphorous effluent limits are only effective during the time period associated with the credit.

RESTRICTIONS ON ALLOWABLE TRADES

Localized Impacts. [See note at end of document]

No Duplicative Ownership of Credits. The permittee may only increase its effluent limit based on credits that are not held by any other trading participant at the credit transfer deadline [to be defined].

PROCEDURAL REQUIREMENTS TO TRANSFER A CREDIT

Procedure for Transferring Credit. To create a valid transfer of a credit, the transferor and transferee must complete a trade notification form in substantially the same form as the attached example. At a minimum, the form must contain:

- Transferee:
    Name
    NPDES permit number
    Name and telephone number of authorized representative

- Transferor:
    Name
    NPDES permit number (if applicable)
    Name and telephone number of authorized representative

- Credit Transferred:
    Amount of Credit (in Parma Pounds)
    Month of Credit

- Certifying statement that indicates the transferee's understanding of the order in which credits are transferred in the record-keeping system.

- Dated signatures of transferee's and transferor's representatives

Recordkeeping System. No trade is valid unless it is recorded in a single trade tracking system that records all trades, and which generates a monthly summary of all trades valid for that calendar month, in substantially the same form as the attached example. The recordkeeping system must have the capability of ensuring that a particular credit is not held by more than one trading participant at a time. The trade notification form must be submitted by the credit transfer deadline in order for it be recorded in the recordkeeping system in time for it to be reported in the monthly trade summary.

REPORTING AND RECORDKEEPING REQUIREMENTS

Reporting Trades by NPDES Permit Holders to EPA. The Permittee shall submit to EPA, along with its discharge monitoring report (DMR), the trade summary described above for the period covered by the DMR. On each DMR, for the applicable reporting month the Permittee shall report (A) its actual discharge; (B) the total amount of credits (in Parma Pounds) that it obtained through transfers from other parties, as shown on the trade summary submitted with the DMR; (C) the total amount of credits (in Parma Pounds) that it created through voluntary effluent limit reductions and transferred to another party, as shown on the trade summary submitted with the DMR; (D) its location ratio; and (E) its "adjusted discharge", which is equal to A - B/D + C/D.

DMRs shall be submitted to EPA. Monitoring results shall be summarized each month on the Discharge Monitoring Report (DMR) form. The reports shall be submitted monthly and are to be postmarked by the 20th day of the following month.

Recordkeeping. The Permittee shall retain all records pertaining to the transfer of any credits that it generates or obtains, including all monitoring information. The Permittee shall submit these records to EPA or IDEQ upon request.

LOWER BOISE RIVER EFFLUENT TRADING DEMONSTRATION PROJECT

Draft Permit Outline for PS-PS Downstream Trades

09/18/00

This example is for a point source discharger that is buying phosphorus credits from another point source discharger located on the same river, and downstream of its facility.

AUTHORIZATION TO TRADE

The permittee is authorized to trade pursuant to _____ (the document that the trading language is housed in), and the conditions contained within this section of the permit.

POINT SOURCE BASE EFFLUENT LIMITATIONS

Base Phosphorus Effluent Limit. The NPDES permit will contain an average monthly and an average weekly base phosphorus effluent limit. (The base limits will be derived from the wasteload allocation contained in the TMDL for the Lower Boise River and its tributaries).

PHOSPHOROUS DISCHARGE REDUCTIONS, CREDITS AND INCREASES

Voluntary Reductions of Permittee's Phosphorous Effluent Limit, and Generation of Credit. The Permittee may voluntarily reduce its base phosphorous effluent limit by a particular amount for a particular calendar month. *This creates a "credit" that may be transferred to another party downstream of its facility.*

Voluntary Reductions of Other Point Source's Phosphorous Effluent Limit, and Generation of Credit. *A point source that is an NPDES permittee, and is located downstream from the permittee, may voluntarily reduce its base phosphorous effluent limit by a particular amount for particular calendar month.* This creates a "credit" that may be transferred to this Permittee.

Increase of Point Source Effluent Limit by Receiving Transferred Credit. The permittee may increase its phosphorous effluent limit by receiving the transfer of a credit, *generated by a point source that is an NPDES permittee discharging downstream of the permittee's outfall.*

AMOUNTS OF REDUCTIONS, CREDITS AND INCREASES

Reduction Amount -- Point Sources. The amount of a point source's reduction is the amount by which

the point source voluntarily reduces its phosphorous effluent limit below its base effluent limit for a given calendar month.

River Location Ratios for Sources. Each source, including the permittee, is subject to a particular river location ratio. River location ratios will be contained in _____ [and an appendix to the permit], and subject to that document's notice, comment, review, and approval requirements. The permittee's river location ratio is ___.

Credit Amount ("Parma Pounds"). The amount of the transferrable credit that arises from a point source reduction is expressed in terms of "Parma Pounds", and is determined by multiplying the amount of the reduction by the source's location ratio.

Effluent Limit Increase Amount. If a credit is transferred to the permittee, then the amount by which the permittee's phosphorous effluent limit increases is the amount of the credit (in Parma Pounds) divided by the permittee's location ratio.

TIMING OF REDUCTIONS, CREDITS AND INCREASES

Time Period of Credit Based on Point Source Reduction. In the case of a credit based on an effluent limit reduction by another permitted point source, the time period associated with the credit is the calendar month(s) of the other point source's effluent limit reduction.

Effective Time Period of Effluent Limit Increase Resulting from Trade. If a credit is transferred to the Permittee, the resulting increase in the Permittee's base phosphorous effluent limits are only effective during the time period associated with the credit.

RESTRICTIONS ON ALLOWABLE TRADES

Localized Impacts. [See note at end of document.]

No Duplicative Ownership of Credits. The permittee may only increase its effluent limit based on credits that are not held by any other trading participant at the credit transfer deadline [to be defined].

PROCEDURAL REQUIREMENTS TO TRANSFER A CREDIT

Procedure for Transferring Credit. To create a valid transfer of a credit, the transferor and transferee must complete a trade notification form in substantially the same form as the attached example. At a minimum, the form must contain:

- Transferee:
  - Name
  - NPDES permit number
  - Name and telephone number of authorized representative

- Transferor:
  - Name
  - NPDES permit number (if applicable)
  - Name and telephone number of authorized representative

- Credit Transferred:
  - Amount of Credit (in Parma Pounds)
  - Month of Credit
  - Reduction Credit Certificate Number

- Certifying statement that indicates the transferee's understanding of the order in which credits are transferred in the record-keeping system.

- Dated signatures of transferee's and transferor's representatives

Recordkeeping System. No trade is valid unless it is recorded in a single trade tracking system that records all trades, and which generates a monthly summary of all trades valid for that calendar month, in substantially the same form as the attached example. The recordkeeping system must have the capability of ensuring that a particular credit is not held by more than one trading participant at a time. The trade notification form must be submitted by the credit transfer deadline in order for it be recorded in the recordkeeping system in time for it to be reported in the monthly trade summary.

REPORTING AND RECORDKEEPING REQUIREMENTS

Reporting Trades by NPDES Permit Holders to EPA. The Permittee shall submit to EPA, along with its discharge monitoring report (DMR), the trade summary described above for the period covered by the DMR. On each DMR, for the applicable reporting month the Permittee shall report (A) its actual discharge; (B) the total amount of credits (in Parma Pounds) that it obtained through transfers from

other parties, as shown on the trade summary submitted with the DMR; (C) the total amount of credits (in Parma Pounds) that it created through voluntary effluent limit reductions and transferred to another party, as shown on the trade summary submitted with the DMR; (D) its location ratio; and (E) its "adjusted discharge", which is equal to A - B/D + C/D.

DMRs shall be submitted to EPA. Monitoring results shall be summarized each month on the Discharge Monitoring Report (DMR) form. The reports shall be submitted monthly and are to be postmarked by the 20th day of the following month.

Recordkeeping. The Permittee shall retain all records pertaining to the transfer of any credits that it generates or obtains, including all monitoring information. The Permittee shall submit these records to EPA or IDEQ upon request.

LOWER BOISE EFFLUENT TRADING DEMONSTRATION PROJECT

Draft Permit Outline for PS-NPS Trades

09/18/00

AUTHORIZATION TO TRADE

The permittee is authorized to trade pursuant to the requirement in _____ (the document that the trading language is housed in), and the conditions contained within this section of the permit.

POINT SOURCE BASE EFFLUENT LIMITATIONS

Base Phosphorus Effluent Limit. The NPDES permit will contain an average monthly and an average weekly base phosphorus effluent limit. (The base limits will be derived from the wasteload allocation contained in the TMDL for the Lower Boise River and its tributaries).

PHOSPHOROUS DISCHARGE REDUCTIONS, CREDITS AND INCREASES

Nonpoint Source Reductions, and Generation of Credits. A nonpoint source may voluntarily reduce the amount of phosphorous it discharges. This creates a "credit" that may be transferred to this Permittee or another party. The credit is invalid if the underlying reduction is shown to not have occurred.

Increase of Point Source Effluent Limit by Receiving Transferred Credit. The permittee may increase its phosphorous effluent limit by receiving the transfer of a valid credit, *generated by a nonpoint source located in the Lower Boise River Watershed. If the credit is determined to be invalid, then the phosphorous limit will not be adjusted by the amount of the credit.*

AMOUNTS OF REDUCTIONS, CREDITS AND INCREASES

Reduction Amount -- Nonpoint Sources. The amount of a nonpoint source's reduction that may be used to calculate the amount of a transferrable credit is . . . . [This is the NPS creditable reductions issue, which calls for a mechanism to be designed that will determine what portion is surplus to the NPS's water quality derived phosphorous regulatory obligations, and therefore tradable as a reduction credit.]

Credit Amount ("Parma Pounds"). The amount of the transferrable credit that arises from a nonpoint source reduction is expressed in terms of "Parma Pounds", and is determined by multiplying the amount of the reduction by (1) the source's river location ratio, *and (2) the source's drainage delivery ratio, and (3) the site location factor, if applicable. In the case of a nonpoint source reduction, only*

the portion of the reduction that is eligible to generate a transferrable credit may be used in this calculation.

Effluent Limit Increase Amount. If a credit is transferred to the permittee, then the amount by which the permittee's phosphorous effluent limit increases is the amount of the credit (in Parma Pounds) divided by the permittee's river location ratio.

River Location Ratios. Each point source and nonpoint source, including the permittee, is subject to a particular river location ratio. River location ratios will be contained in _____ [and an appendix to the permit], and subject to that document's notice, comment, review, and approval requirements. The permittee's river location ratio is ___.

Drainage Delivery Ratios. In addition to the applicable river location ratios, some nonpoint sources are also subject to drainage delivery ratios. Drainage delivery ratios will be contained in _____ [and an appendix to the permit], and subject to that document's notice, comment, review, and approval requirements.

Site Location Factor. In addition to the applicable river location and drainage delivery ratios, some nonpoint sources are also subject to site location factors. Site location factor will be contained in _____ [and an appendix to the permit], and subject to that document's notice, comment, review, and approval requirements.

TIMING OF REDUCTIONS, CREDITS AND INCREASES

Time Period of Credit Based on Nonpoint Source Reduction. In the case of a credit based on a discharge reduction by a nonpoint source, the time period associated with the credit is the time period associated with the reduction, as described in more detail below [where?].

Effective Time Period of Effluent Limit Increase Resulting from Trade. If a credit is transferred to the Permittee, the resulting increase in the Permittee's base phosphorous effluent limits are only effective during the time period associated with the credit.

RESTRICTIONS ON ALLOWABLE TRADES

Localized Impacts. [See note at end of document.]

No Duplicative Ownership of Credits. The permittee may only increase its effluent limit based on credits that are not held by any other trading participant at the credit transfer deadline [to be defined].

REQUIREMENTS FOR CREATION OF CREDIT BASED ON NONPOINT SOURCE REDUCTION

BMP List. A nonpoint source generates a transferrable credit by implementing a best management practice ("BMP") described on a BMP list approved by EPA and DEQ. The BMP list will be contained in _____, and subject to that document's notice, comment, review, and approval requirements. The list of approved BMPs and associated monitoring requirements will be contained in an Appendix to the permit.

Procedure for Creating Nonpoint Source Credit that may be Transferred. A nonpoint source credit may be transferred only if the purchaser has completed a reduction credit certificate in substantially the same form as the attached example. At a minimum, the certificate must contain:

- *Identification of NPS (name, address, phone #)*
- *Type of BMP; Location of BMP*
- *Monitoring Method and Frequency*
- *Monitoring Results (actual measured quantities, or observations regarding installation and maintenance, at NPS)*
- *Subtraction of a portion of the reported reduction amount (in local pounds) to meet the Water Quality Contribution requirement as specified in [to be determined].*
- *Conversion of reduction quantity to Parma Pounds (multiply by NPS river location ratio, drainage delivery ratios, and site location factors, where applicable)*
- *Time period for which credit is verified, per monitoring requirements for that BMP*
- *Certifying statement signed by the PS that the information provided is true, accurate and complete, and that the installation, maintenance, and monitoring of the BMP meets the requirements for that BMP as specified in the BMP List.*

PROCEDURAL REQUIREMENTS TO TRANSFER A CREDIT

Procedure for Transferring Credit. To create a valid transfer of a credit, the transferor and transferee must complete a trade notification form in substantially the same form as the attached example. At a minimum, the form must contain:

- Transferee:
  - Name
  - NPDES permit number
  - Name and telephone number of authorized representative

- Transferor:

Name
NPDES permit number (if applicable)
Name and telephone number of authorized representative

- Credit Transferred:
  Amount of Credit (in Parma Pounds)
  Month of Credit
  Reduction Credit Certificate Number

- Certifying statement that indicates the transferee's understanding of the order in which credits are transferred in the record-keeping system *and the permitted source transferee that they have determined the validity of the generation of the underlying credits being transferred.*

- Dated signatures of transferee's and transferor's representatives

- NPS consent to access by EPA, DEQ, or a representative, to inspect BMP (for any credit that is based on an NPS reduction)

Recordkeeping System. No trade is valid unless it is recorded in a single trade tracking system that records all trades, and which generates a monthly summary of all trades valid for that calendar month, in substantially the same form as the attached example. The trade notification form must be submitted by the credit transfer deadline in order for it be recorded in the recordkeeping system in time for it to be reported in the monthly trade summary.

REPORTING AND RECORDKEEPING REQUIREMENTS

Reporting Trades by NPDES Permit Holders to EPA. The Permittee shall submit to EPA, along with its discharge monitoring report (DMR), the trade summary described above for the period covered by the DMR. On each DMR, for the applicable reporting month the Permittee shall report (A) its actual discharge; (B) the total amount of credits (in Parma Pounds) that it obtained through transfers from other parties, as shown on the trade summary submitted with the DMR; (C) the total amount of credits (in Parma Pounds) that it created through voluntary effluent limit reductions and transferred to another party, as shown on the trade summary submitted with the DMR; (D) its location ratio; and (E) its "adjusted discharge", which is equal to A - B/D + C/D.

DMRs shall be submitted to EPA 45 days after the last day of the reporting month.

Recordkeeping. The Permittee must collect monitoring information as specified for that BMP on the BMP list. The Permittee shall retain all records pertaining to the transfer of any credits that it generates

or obtains, including all monitoring information it must collect to establish and verify the underlying reduction. The Permittee shall submit these records to EPA or IDEQ upon request.

NOTES ON LANGUAGE IN DRAFT PERMIT OUTLINES

The three sections of the draft permit outline are meant to cover all types of trading, with the unique requirements of each type of trading highlighted with the text in italics. The language in the outline addresses the major elements of effluent trading only. It is not meant to address all conditions that may be incorporated in the final permit to allow effluent trading. More detailed language will be developed as the effluent trading project is finalized.

- *PS-PS downstream trades*, in which a point source discharger is buying phosphorus credits from another point source discharger located on the same river, and downstream of its facility;

- *PS-PS upstream trades*, in which a point source discharger is buying phosphorus credits from another point source discharger located on the same river, and upstream of its facility; and

- *PS-NPS trades.*

Localized Impacts

Trading has the potential to cause water quality impacts in the areas where trading occurs. The ratios that have been developed are only designed to address the net impact at Parma of a trade between sources elsewhere in the watershed. The ratios do not, however, address a trade's potential net impact at any other point in the river. Prior to allowing any trading within the context of a permit, an analysis of the watershed needs to be completed that will ensure that specific trades do not degrade water quality within the area of the trade, taking into account the effects of shifting phosphorous loading to different points in the watershed and the interaction between phosphorous and other environmental factors.

The potential for localized impacts is least when the reducer is upstream of the increaser. However, when there are diversions below the upstream source and above the downstream source, the full benefit of the upstream source's decrease may not be felt in the river until some distance below the downstream source, when the irrigation return flows reenter the river. This could result in net phosphorous increases in the river below the downstream source and above the return flow. A mechanism would need to be developed to avoid any such trades that may cause exceedances of water quality standards.

If the increaser is upstream of a decreaser, there would be an expected net increase in phosphorous loadings in the stretch of the river between the two sources. The localized impacts analysis will have to ensure that the ambient water located between the increaser and the decreaser will not be adversely impacted by the increase in load.

If two sources are not both on the main stem or on the same tributary, then there is an additional factor

that needs to be considered. There would be a net increase in phosphorous loading in the stretch immediately downstream of the increaser, before the tributary joins the main stem (or the two tributaries meet).

Presumably, analysis done in connection with the Lower Boise River TMDL will provide a basis to adequately address these issues, and provisions could be incorporated in the permit accordingly.

Water Quality Requirements in NPDES Permits

The Clean Water Act and the associated regulations impose certain requirements on NPDES permits and compliance schedules in connection with water quality standards. For example, the permitting statutory and regulatory provisions require that a reasonable potential analysis be performed, and that numeric permit limits be imposed that will prevent the source from causing or contributing to exceedances of water quality standards, within a certain timeframe specified by regulation. The permitting requirements may be more stringent than the conditions contained in an approved TMDL, but nonetheless would apply to any permits issued to point sources. Some issues that could arise include the establishment of a numeric target for phosphorous interpreting the narrative criterion, and an analysis of the effects of total vs. dissolved phosphorous.

Variable Effluent Limits

The model language lets a permittee increase or decrease its effluent limit subject to the credits that it purchases or sells, without going through the permit modification procedures. This approach will only be viable under certain conditions. The procedural and substantive trading requirements contained in the TMDL, permit, and other documents, would need to be adequate to ensure the protection of water quality standards in the Brownlee Reservoir and in the Lower Boise River and its tributaries. At the same time, the requirements would need to be simple enough to be well understood by the public when those documents are issued.

Credit Amount from Measured NPS Reductions

A critical assumption underlying the viability of PS-NPS trading is that the NPS reductions can be reliably quantified as a prerequisite to a PS increasing its discharge on account of that NPS reduction. The above language assumes that monitoring methods will be developed that measure NPS phosphorous reductions with the same reliability as methods currently required of NPDES sources for monitoring their own phosphorous discharges. The frequency of sampling needed to achieve the same confidence interval is still to be established for each BMP project, as well as the appropriate quality assurance and quality control procedure to be followed for the specified sampling methods. The

prescribed monitoring methods will also need to take in account the factors for each BMP project that can affect the accuracy of the measurement method, such as the ability to measure flow volumes over land surfaces and the potential for leakage to groundwater.

Credit Amounts from Calculated NPS Reductions

For those BMPs for which it is not feasible or cost-effective to measure the reductions, the above approach assumes that a practical and scientifically credible means will be devised to determine the amount of reduction from a given BMP, and to compare it to the reduction called for by the TMDL.

Third Party BMP Site Reviews

EPA has the authority to inspect point sources, but does not have that authority for nonpoint sources. Since trading will allow a PS to increase phosphorous discharges on account of a NPS decrease, we need to achieve consensus on a means of verifying NPS reductions with enough certainty to justify allowing a PS to increase its discharge on account of that reduction.
The Soil Conservation Commission has offered to assist EPA and DEQ in their audit of NPDES sources by providing information from its routine project reviews and being available to conduct special on-site reviews of the BMPs used to generate the purchased credits to ensure that the monitoring methods prescribed in the BMP list have been installed and implemented properly. EPA, SCC and DEQ will negotiate a Memorandum of Understanding to identify the roles of each of the three agencies to undertake this trading requirement.

Determining the Tradable Portion of NPS Reductions

The above approach assumes that a method will be devised to determine how much of a NPS's reduction is necessary to meet the TMDL load reduction target, and how much is in excess of that and therefore eligible to generate a transferrable credit. This will need to be implemented through a mechanism incorporated in the TMDL and the permits. That mechanism will also have to satisfy the requirements as to simplicity and clarity as discussed in the comment regarding the variable limits approach.

Ratios for Non-point Sources

The above language assumes that the drainage delivery ratios and site location factors will be developed for each non-point source that engages in trading.

Trade Tracking Mechanism

The establishment of a centralized trade tracking system is essential for determining the validity of a trade, since the PS will be required to provide a DMR with a monthly trade summary of all trades. The trade tracking system must ensure that there is no duplicative ownership of credits. DEQ is responsible for auditing the trade tracking system if it is developed by a third party, or to develop the system itself to perform these tasks.

Credit Transfer Deadline

Although the above language specifies a deadline for filing a DMR for a given month, it does not specify the deadline by which a trade must be completed in order for it to be included in a given month's DMR. That deadline still must be determined.

PS Monitoring Requirements

Ambient and effluent monitoring requirements for flow and phosphorus (and possibly other parameters) will be included in all permits. Frequency of monitoring will be determined at a later date.

Other Key Issues

The above language also assumes that we will resolve other key issues, some of which may require changes to this language. Examples are an adequate process associated with the elements of the program that are intended to be embodied in documents outside of the permit, Paperwork Reduction Act questions associated with the new reporting forms we are creating, and the audit plan for the trade tracking system.

DEQ Discussion of Potential TMDL Role in Addressing Local Impact Concerns

It is expected that "total mass" caps for individual point sources will be established for the trading program based on the criteria for in-river quality identified by the Lower Boise River and other associated TMDLs. It is DEQ's opinion that these caps, in combination with the rigorous evaluation of the ratios that have been established for the trading system will act in a protective fashion to reduce the potential for localized impacts to the river.

While the concerns describing the potential for local impacts from trading from all possible directions in the river are valid to a point, a close evaluation of the trading system has not shown them to be significant provided that appropriate caps are established based on the water-quality targets identified by the TMDL. The TMDL should address the means by which appropriate caps will be established.

To answer the first concern specifically (decreasor upstream of increasor), if appropriate caps are established for the trading system, there are no diversions currently located in the Lower Boise River system (below where the NY Canal branches off) that are large enough to cause a sufficiently significant change in the total in-river flow to result in the problem that is described. The majority of the reduction (water with a lower concentration of phosphorus) will still be transmitted directly downstream, with only a minor percentage of the water being removed from the main channel. DEQ's analyses show that a diversion would have to remove in excess of 60% of the total in-river flow volume for a trade to result in a significant local water quality problem. This is based on both the critical conditions analysis and the catastrophic events assessment performed on the location ratios during the development of the trading system design.

To answer the second concern specifically (increasor upstream of decreasor), if appropriate caps are established for the trading system, sufficient in-river mixing has been observed to occur to prevent localized impacts and ensure a uniform reduced concentration within a reasonable distance downstream of the reducer. Once again, this observation relies on the establishment of trading caps appropriate to the water-quality targets identified by the TMDL.

Lower Boise River Phosphorus Model Trade

CONCEPTUAL DESIGN OF A COMBINED SEDIMENT BASIN/WETLAND SYSTEM

TECHNICAL MEMORANDUM

PREPARED FOR

The City of Boise

PREPARED BY

Brown and Caldwell
7535 East Hampden Avenue
Denver, Colorado 80231

November 9, 1999

Lower Boise River Phosphorus Model Trade

CONCEPTUAL DESIGN OF A COMBINED SEDIMENT BASIN/WETLAND SYSTEM

TECHNICAL MEMORANDUM

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APPENDIX

INTRODUCTION

Purpose and Scope

Purpose. As part of the pilot trading program framework development for the Lower Boise River Watershed, a conceptual design for a combined sediment basin/wetland system was prepared. The design was developed utilizing actual data from the proposed site to better understand performance and associated costs. Information provided by the design was used as a point source-non point source phosphorus model trade for the trading program framework.

Scope. Three tasks were identified as part of the scope:

- Task 1 – Data collection and evaluation

  The objective of this task was to evaluate and analyze existing data pertaining to the proposed site.

- Task 2 – Design Calculations

  The objective of this task was to perform calculations to size the combined sediment basin/wetland system and to estimate phosphorus removal by various components of the system.

- Task 3 – Conceptual Design Plans

  The objective of this task was to develop conceptual plans for the combined sediment basin/wetland system. As part of this task, an estimate of the associated probable costs was prepared based on quantities calculated from the design plans and unit prices for materials, equipment, and labor.

Site Description and Basis for Selection

Site Descriptions. Four sites were considered as possible locations for the phosphorus model trade project. These sites were identified by Dave Ferguson of the Soil Conservation Commission (SCC). Three of these locations were potential retention basin sites with some small areas for wetlands, “A” Drain, Noble Drain, and Solomon Drain. The fourth location, Mason Creek, was evaluated as a potential wetland site. Each site had advantages or limitations, which are described briefly below. Appendix D includes photos and a map for the location of these sites.

- “A” Drain

  The “A” Drain site has a relatively small tributary drainage area and, therefore, requires a smaller facility to convey a flood through the site. The area, however, has limited storage capacity, requiring a relatively high embankment, which would provide limited phosphorus

treatment. The area for wetland creation is also limited by topography.

- Noble Drain

  The Noble Drain site has a larger tributary area than "A" Drain and the same site limitations. It is possible that Noble Drain could provide a larger area for wetland creation than "A" Drain, which may improve phosphorus removal. The valley area is broader than the "A" Drain, which would require longer embankments and increase costs, but could increase storage volume.

- Solomon Drain

  The Solomon Drain site also has a larger tributary area than "A" Drain and the same site limitations. It is possible than Solomon Drain could provide a larger area for wetland creation than "A" Drain, which may improve phosphorus removal. The valley area is broader than the "A" Drain, which would require longer embankments and increase costs, but could increase storage volume.

- Mason Creek

  Mason Creek was selected as the preferred site for the conceptual design. First, since the site is off-channel, there is an opportunity to optimize treatment based on available area for wetlands creation. Second, an off-channel facility requires fewer facilities for flood control, which reduces costs. Third, the site is close to the Lower Boise River and phosphorus removal will have a more direct impact on reducing the phosphorus concentrations in the River. Fourth, there is limited topographic relief, due to past farming practices, which allowed a conceptual design without detailed survey information. Technically, wetland systems are the best "natural system" method to remove phosphorus and this site provides the largest area for wetland creation.

  The site, however, has limitations. First, it is subject to seasonal backwater flooding from the Lower Boise River. Aerial photographs from the Bureau of Reclamation in Boise, Idaho, suggest this area has been relatively minor in the past, but a floodplain analysis was not available to better assess the risks. Second, the soil mantle is relatively shallow (less than 3 feet), with pervious soils or bedrock below. This limits the depth of excavation for emergent wetlands or retention basins. Finally, most of the soils at the site are classified as sandy-silty loams, which are less desirable for wetland creation and may require soil amendments to facilitate plant growth.

Site Selection and Basis. The possibility of selecting one of these four sites for the model trade, was discussed at a July 29, 1999 Agricultural Work Group

Meeting. Based on recommendations by Brown and Caldwell and the Agricultural Work Group, the Mason Creek site was chosen for the conceptual design.

Due to the limitations specified above, some preliminary analysis was performed in regard to the flooding and existing wetlands. These preliminary findings, limited potential for flooding and no existing wetlands (per the National Wetlands Inventory) assisted selection of this site for the conceptual design.

Data Collection and Evaluation

Water Quality. Water quality, specifically total phosphorus (TP), total suspended solids (TSS), and flow information, was obtained from USGS at the Mason Creek (at Mouth near Caldwell site) confluence with the Lower Boise River for the years 1994 – 1998 (provisional) (USGS, 1997).

Total phosphorus concentrations ranged from 0.16 mg/L (minimum) to 0.93 mg/L (maximum) with an average concentration of 0.32 mg/L. Total suspended solids concentrations ranged from 12 mg/L (minimum) to 525 mg/L (maximum) with an average concentration of 142 mg/L. The average daily flow was 100 cfs.

Watershed Characteristics. Several aerial photos provided by the Bureau of Reclamation in Boise, Idaho were reviewed to assess flooding potential. National Wetland Inventory maps were reviewed to assess the possibility of existing wetlands.

DESIGN APPROACH

As part of the conceptual design process for the wetland system (system), two approaches were evaluated, the Natural Resources Conservation Service (NRCS) five-component constructed wetlands approach and the conventional wastewater treatment (WWT)system approach. These approaches are described below. As a result of this evaluation, Brown and Caldwell determined that a hybrid design based on a combination of the two approaches would be best for the selected site.

NRCS Constructed Wetland System

The NRCS five-component system (NRCS, 1999b) was designed for treatment of attached and soluble nutrients in urban storm runoff and agricultural irrigation return flows. The breakdown includes a) sediment basin (3%), b) primary grass-filter area (23%), c) vegetated wetlands (23%), d) deep-water pond (41%), and e) polishing filter (10%). These components are proportioned on a percentage basis based on the total surface area (i.e., facility size) and the system is sized for a minimum four-day hydraulic retention time (HRT). Different recommendations are provided for treatment of continuous runoff agricultural return flows versus intermittent stormwater runoff and for phosphorus removal versus the removal of other

pollutants. The maximum loading rate for optimum phosphorus removal recommended by the NRCS is 3 $g/m^2/yr$.

Conventional Wastewater System

The conventional wastewater treatment system utilizes wetlands for tertiary treatment and for "polishing" municipal or industrial effluent to meet discharge limits. The effluent has already received primary (i.e., sediment removal) and secondary treatment prior to being discharged to the wetland cells. The constructed wetland is designed to optimize natural physical, chemical, and biological treatment processes. The essential role of vegetation is believed to be a facilitator for microbial growth, for transmission of oxygen to the root system (Reed, 1991) and for nutrient uptake and transformation, where pollutants are transformed into basic elements, compost, and plant biomass.

Two basic types of constructed wetlands are used (Reed, 1991) for wastewater effluent treatment. The first includes emergent vegetation and a water surface exposed to the atmosphere ("free water surface" wetland). The bottom is carefully graded to ensure uniform flow and inlet/outlet structures provide even distribution and control of water depth. The "free water surface" wetland cells are finely graded, uniformly shaped basins with controlled flow rates and water depths in the individual cells. Relatively consistent phosphorus removal can be achieved by closely controlled flows, depths, plant species, surface area, and hydraulic retention times. The same components are present in the second type of wetland, but also contain a media (i.e., soil) and the water level is designed to remain below the surface of the media ("subsurface flow" wetland).

Proposed Wetland System

Two objectives of this conceptual design were to optimize phosphorus removal and minimize operation and maintenance costs while providing flexibility.

The proposed wetland system for the Mason Creek site is located in Caldwell, Idaho just above the confluence with the Lower Boise River (Appendix D). The design approach used is a hybrid of the NRCS approach and conventional WWT system. Due to the site limitations, a deep-water pond is not practical; excavations are limited to 2-feet to avoid pervious sub-soils and shallow groundwater; and fills for berms are limited to 3-feet to minimize impacts on flood storage of the Lower Boise River. In addition, the area of the site (i.e., approximately 54 acres for actual wetlands) limits treatment of flow from Mason Creek to about 6 to 7 cfs, based on a recommended minimum HRT of four days. Therefore, the conventional treatment approach was investigated further by analyzing the effect of flow rate on pounds of phosphorus removed annually.

Optimize Phosphorus Removal. Using equations developed by Kadlec and Knight (1996), the amount of phosphorus removed by 54 acres of wetlands

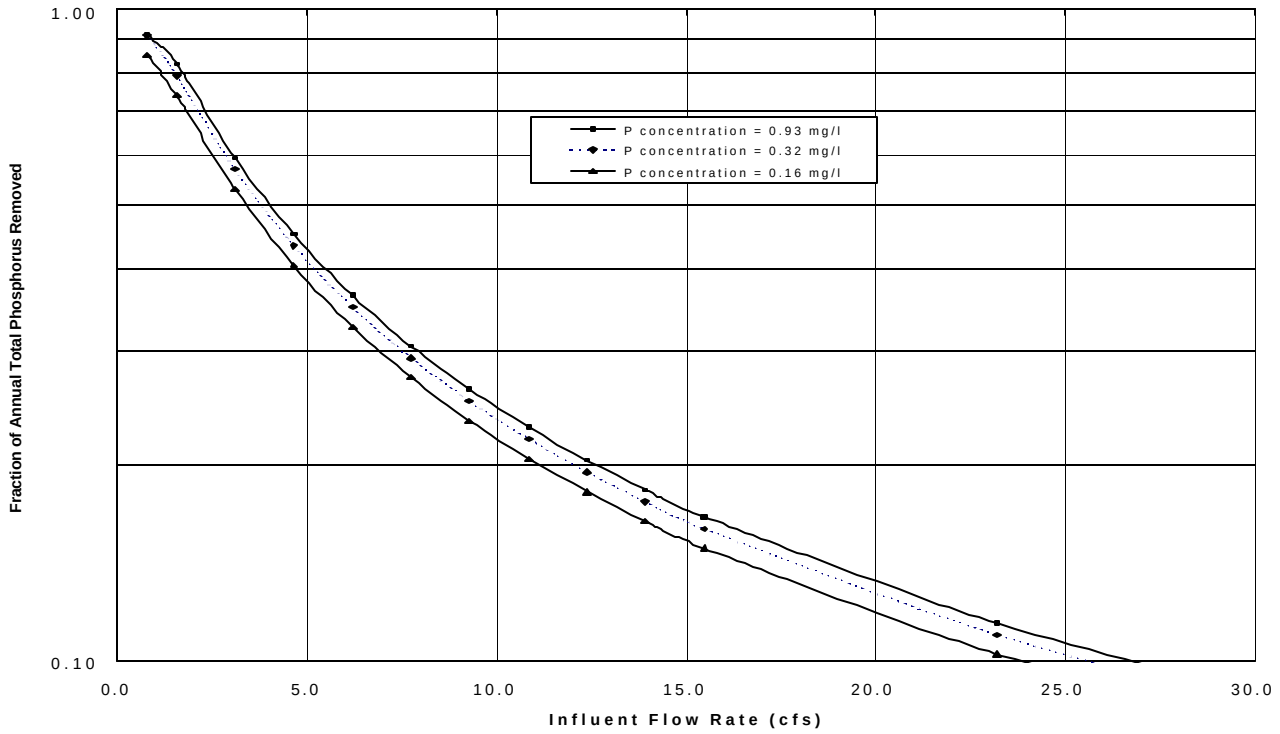

Figure 1. Fraction of Total Phosphorus removed as a function of influent flow rate.

was calculated for flows ranging from 1 to 20 cfs and for the minimum (0.16 mg/L), average (0.32 mg/L), and maximum total phosphorus (0.93 mg/L) influent concentrations (see Appendix B). A 200 day (April 15 – October 31) growing season was assumed.

Figure 1 shows the fraction of TP removed (in pounds) as a function of flow rate and demonstrates that the "efficiency" of the wetlands, as measured by the fraction of TP removed, drops from 90% at 1 cfs to 15% at 15 cfs. If flow rates through the wetlands were limited to 7 cfs or less, as suggested by the NRCS approach, the efficiency to remove TP would be 30% or better. This is considerably less than results reported by the NRCS (NRCS, 1999a). The difference in the efficiency for these two approaches may be due to design modifications (i.e., not using a deep water pond) and that the Kadlec and Knight (1996) equations are based on organic phosphorus (as opposed to inorganic phosphorus) and may under predict total phosphorus removal.

Figure 2 shows the amount of TP removed (in pounds) as a function of flow rate. An important trend is observed. As the flow rate through the wetlands increases, the mass of TP removed increases, but with diminishing results. At an average influent concentration (0.32 mg/L), an increase in flow from 1 to 6 cfs will increase the pounds total P removed from 616 to 813, or by 32%. However, increasing flow rate from 10 cfs to 15 cfs, the pounds removed only increases from 864 to 890, or by 3%. This analysis demonstrates that the amount of TP removed can be optimized for this site by increasing flow rate, without regards to the efficiency of the removal process (i.e., the fraction of TP removed).

For the purpose of design, 15 cfs was used, due to practical limitations of facility size (i.e., pipes, structures), velocity of flow through the system, and the unknown effects of operating a wetland system at higher flow rates. Based on an average phosphorus concentration of 0.32 mg/l, the design flow rate represents a loading rate of 11 g/m^2, which is 3.6 times greater than recommended by the NRCS approach.

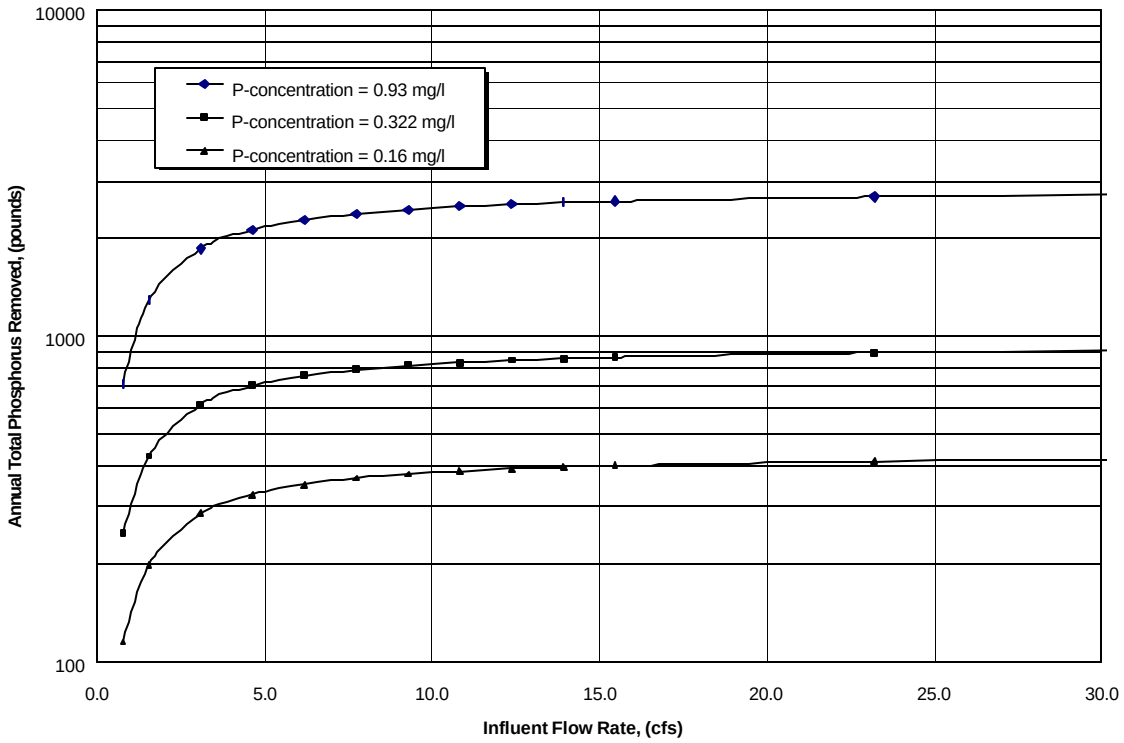

Figure 2. Total Phosphorus removed as a function of influent flow rate.

Operation and Maintenance Considerations. Since the performance of the treatment wetlands is dependent on the ability to control flow rates and flow depths, design elements were included to improve and simplify operation and maintenance of the wetland design and flow distribution system. The elements of the distribution system include:

- The intake structure allows relatively precise controls of flows directed through the system, and thereby enhances phosphorus removal efficiencies.

- The structures that control flows between wetland cells also allow for a wide range of flow rates and flow depths to account for changing

conditions in the wetland cells and to optimize plant growth and nutrient removal.

- The ability to bypass portions of the system is provided by two parallel systems and separate piping with valves that allows portions of the system to be shut down for maintenance activities or repairs. This minimizes "downtime" for the entire system, thus allowing some level continuous phosphorus removal.

- The depth of the wetland cells allows for accumulation of biomass for up to 30-years, based on accumulation rates of 1-inch per year (Hammer 1989, NRCS 1999). This will minimize frequency of cleaning the entire system.

- The sediment basin provided storage for up to 6-years, while maintaining an optimum removal efficiency, before sediment must be removed. For estimating costs (see below), however, annual sediment removal was assumed.

- Each sediment basin can be shutdown for sediment removal while allowing design flows to pass through the remaining sediment basin, although at a lower efficiency.

- The system is designed to operate with minimal flows during off-season. This will help keep plants alive and minimize decay, which can lead to the remobilization of phosphorus.

CONCEPTUAL DESIGN

Description of Features

Drawings of the proposed system have been prepared (see Appendix A). The drawings include an overall conceptual site plan, site plans for the intake facilities, sediment basin, and outlet area, a typical profile through the wetland system, and the associated details.

1. The conceptual plan (drawing 1) shows two parallel systems, each with a sediment basin, primary filter, vegetated wetlands, and polishing filter. Water quality monitoring stations are provided at the inlet and outlet areas.

2. The intake structure (drawing 2) consistS of a weir in Mason Creek to create backwater at the twin gated diversion structure. The flow rate through the intake is controlled by changing the gates to achieve the required differential head in the measuring wells. Equipment for flow rate monitoring and automated

sampling is housed in the monitoring structure. After passing through the intake, flows are distributed to the sediment basins in an open channel. A separate bypass is provided to sluice sediment that may accumulate in the structure.

3. Two separate sediment basins are provided one for each system (drawing 3). Flows from the intake facilities are split and discharged into each sediment basin, allowing one cell to be closed for maintenance (i.e., sediment removal) while the other continues to operate. Flow baffle structures (i.e., wood fences) minimize short-circuiting of flow through the cell, improving sediment removal. Concrete ramps provide vehicle access for sediment removal. Both basins provide a total of up to 6-years of sediment storage at two feet of depth. Bypass piping and gates allow design flows to be distributed to either or both wetland systems when one sediment basin is closed for maintenance.

4. All flows that pass through the wetland cells are discharged through level control structures (drawing 6) into the bypass channel and conveyed to the flow measurement structure (drawing 4). These structures are consistent for all cells (i.e. A1-A2-A3 and B1-B2-B3). Flow rates are measured and recorded and samples taken automatically for analysis. Any flows that bypass the wetland cells are combined with flows that are treated prior to sampling, which facilitates a mass-balance analysis of flow and total phosphorus.

5. A general profile of the wetland system is provided on drawing 5. Wetland cell A-2, the vegetated wetland area, includes 2-feet of excavation, which provides storage for biomass accumulation. The sediment basin is also excavated two feet for sediment storage. Cost of the system can be reduced by eliminating or reducing the excavation, but the system life span (i.e., maximum time between installation and replacement of wetland vegetation) will be reduced.

6. Details of the level control structure and embankment between cells are provided on drawing 6. The berm increases the depth of each cell and provides vehicle access throughout the system. The level control structures are designed for 7.5 cfs, or half of the total design flow. One structure required for each cell, which improves uniform distribution of flows across the wetland cell. A level spreader ditch is recommended at the downstream end of the level control structures to improve even distribution of flows (drawing 3). Control gates allow level control structure to be shutdown for maintenance or for “throttling” flows for lower design-flow rates.

Projected System Performance

The ability of the system to remove phosphorus from flows diverted from Mason Creek was estimated separately for the sediment basin and for the wetland portion of the system.

Using the average measured TSS concentration of 142 mg/l (USGS, 1997) and a flow rate of 15 cfs, the sediment basin was calculated to remove up to 32,000 cubic feet of sediment during the 200 day irrigation season (see Appendix B). Using a ratio of 1 pound of phosphorus removed for each ton of sediment removed (Ferguson 1999b), the amount of TP removed by both of the sediment basins is approximately 1,040 pounds TP per season.

The anticipated amount of TP removed by the wetland cells was calculated using the Kadlec and Knight (1996) equations. At a flow rate of 15 cfs and average phosphorus concentration of 0.32 mg/l, 54 acres of wetlands will remove approximately 860 pounds of TP per season. The total amount of TP removed by the sediment basin and wetlands system is approximately 1,900 pounds per season.

To demonstrate the variability of phosphorus removal for the proposed system, Shop Creek, a retention/wetland system in the Cherry Creek reservoir watershed in Denver, Colorado was used for comparison purposes (Chadwick, 1998). The seasonal variation in phosphorus removed was estimated based on an 8-year monitoring study of the Shop Creek facility. Analysis of the data shows that the standard deviation in annual average phosphorus removal varies from 22% for the total system to 25% for the wetlands (see Appendix B).

The projected performance variation for the Mason Creek wetlands is from 15 to 20% (130 – 170 pounds), which is better than Shop Creek. Shop Creek is subject to regular storm events, which reduces HRT and increases flow variability, thereby reducing TP removal. In addition, flows through the Mason Creek wetlands will be more constant and controlled, which results in more consistent removal of TP and less variability.

Estimate of Probable Costs

An estimate of probable costs was prepared for this conceptual design based on calculation of quantities and estimate of unit prices for materials, equipment, and labor. Quantities were calculated using the proposed grades shown on the drawings (Appendix C). Unit prices were obtained from the Means Heavy Construction Cost Data (R. S. Means, 1993) and adjusted for inflation, experience on other projects, and best professional judgement. Unit prices include profit and reflect local market for this type of construction. Therefore, probable costs reflect a public bid process and do not assume price reductions for in-kind or donated labor and materials. Calculations of quantities and probable costs are included in Appendix C.

Table 1 presents a summary of probable costs. Costs are presented as capital costs, optional capital costs, operations and maintenance, and the outcome of a present worth and annual cost analysis.

Table 1. Mason Creek Wetlands Summary of Probable Costs

ITEM	DESCRIPTION	CAPITAL COST
Capital Costs		
Intake Facilities	Diversion at Mason Creek, flow measurement and monitoring station, and distribution to sediment basin	$56,000
Sediment Basin	Two 1.5 acre basins with baffles and maintenance access.	$121,000
Bypass	Control structures, channel, and outlet measuring and monitoring station	$60,000
Water Level Control Structures	6 concrete structures with 5 - 12" diameter outlet pipes for water surface control	$139,000
Wetland Cells	Berms, water control structures and wetland plants	$1,405,000
	Sub-Total	**$1,781,000**
	Contingencies (20%)	**$356,000**
	Engineering (15%)	**$267,000**
	Land Acquisition (60-acres)	**$600,000**
	Grand Total	**$3,004,000**
Optional	Concrete Lining for sediment basin to improve sediment excavation and disposal removal	$203,000
Optional	Liner to minimize interaction with groundwater	$1,921,000
Operations and Maintenance		
	Annual O&M	$71,800
	Harvest wetland plants at 5-year intervals	$74,000
Annualized Costs (I=interest= 7%, n = 30-years)		**$326,000**
	Phosphorus removed by wetlands (pounds/season):	860
	Phosphorus removed by sediment basin (pounds/season):	1040
	Annual cost per pound of phosphorus removed:	**$172**
Annualized Costs (I = 3%, n =30-years)		**$238,600**
	Phosphorus removed by wetlands (pounds/season):	860
	Phosphorus removed by sediment basin (pounds/season):	1040
	Annual cost per pound of phosphorus removed:	**$126**

Capital Costs. Costs are shown for the intake facilities, sediment basin, spillway, water level control structures, and wetland cells. Capital costs include a 20% contingency and 15% for engineering. Land costs were based on $10,000 per acre, as directed by the Effluent Trading Group on August 31, 1999.

Optional Costs. Costs for optional concrete lining of the sediment basin and synthetic liner for the wetland cells are also shown, but are not included in the total or in the calculation of annualized costs (see below).

Operations and Maintenance. Operations and maintenance costs were estimated based on a percentage of capital costs (Hammer, 1989a). Harvesting and disposal of wetland plants at a 5-year interval was also included in operations and maintenance costs.

Present Worth Analysis. A present worth and annual cost analysis was performed using a 30-year life span and interest rates of 3% and 7%. The 30-year life span is consistent with values reported by Hammer (1989a) and accumulation of biomass at the rate of 1-inch per year. The 7% interest rate reflects a public project based on borrowing money by issuing bonds. The 3% rate reflects only inflation and no costs to borrow money. At 7% the annualized costs are $326,000 and at 3% annualized costs are $238,600.

Based on projected annual phosphorus removal of 1,900 pounds, the annual cost to remove phosphorus ranges from $126 per pound to $172 per pound, for 3% and 7% interest rates, respectively.

Cost Comparison

Costs for construction of wetland systems for treatment of stormwater are reported to range from $10,000 per acre to over $30,000 per acre (Zentner, 1995 and Reed, 1991). The average cost for 79 surface flow constructed wetlands for municipal wastewater treatment is reported to be almost $24,000 per acre with a maximum value of $135,000 per acre (Arizona DEQ, 1995). It is important to note that many constructed wetland systems for wastewater do not include the costs of pre-treatment (i.e., primary treatment to remove sediment).

Based on a project area of 60-acres and a present worth of capital and O&M costs, the costs per acre for the Mason Creek wetlands at 7% interest rate is over $67,000.

Plant Selection

The sediment basin, for proper functioning, will have no plants. The primary filter zone is an irrigated pasture that could include wetland grasses such as Red Top. The shallow wetland cells will support emergent wetland plants such as Bulrush

and Pond Weed. The final filter would support herbaceous and woody wetland species such as Willows. It is assumed that the initial plant density will be two-foot centers.

Monitoring

The level of effort for monitoring can vary depending on the strength of the data (i.e., confidence, interval, error). Standard statistical methods exist for determination of the number of samples needed to characterize the central tendency (mean or median) given a desired confidence interval and measure of variation (Gilbert, 1987). The general method assumes data are normally distributed and not correlated, however environmental data are generally log normally distributed. Transformed log normal data are generally necessary for use with methods based on normal distributions. Table 2 below shows that for a 30% error and 90 % confidence interval, 8 samples need to be obtained.

Table 2. Samples Required to Estimate Mean at Specified Percent Error and Confidence Interval

	Samples Required at Various Confidence Intervals		
% Error	.70	.80	.90
10	10	25	48
20	3	8	16
30	1	4	8

SUMMARY AND RECOMMENDATIONS

A conceptual design was prepared for the Mason Creek wetlands, which was the selected site for a facility to reduce phosphorus loads to the Lower Boise River to support a model point source-non point source phosphorus trade. By monitoring the phosphorus loading to and from the system, non-point source phosphorus reduction credits can be obtained. The ability of this system to remove phosphorus was estimated using Kadlac and Knight (1996) equations and data provided by USGS (1997) for Mason Creek. In addition, probable capital and operations and maintenance costs were calculated. Significant findings and recommendations are presented below.

Phosphorus Removal Projections

Pounds of phosphorus removed by the wetlands were calculated as a function of flow rate (Figure 1). The analysis shows that phosphorus removed can be optimized for the site by increasing flow rate, without regards to efficiency of the removal process (i.e., fraction of the phosphorus removed). This approach is unique because often the design basis is based on meeting certain effluent limitations, which requires a relatively high level of treatment efficiency. However, since the objective of the Mason Creek wetlands is to maximize pounds of phosphorus removal, effluent concentration is not a primary consideration.

For this analysis, the proposed system was designed for a flow rate of 15 cfs, which was projected to remove 860 pounds of phosphorus per season by the wetlands. The sediment basin was calculated to remove 1,040 pounds of phosphorus, based on phosphorus to sediment ratio of 1 pound of TP removed per ton of sediment removed. The combination of wetlands and sediment basin was projected to remove 1,900 pounds of TP per year. Based on long-term performance measurements of Shop Creek retention/wetland system in Colorado, the annual variation in performance for the Mason Creek wetlands is expected to be from 15 to 20% (130 – 170 pounds removed).

Conceptual Design

Conceptual design plans were prepared for the proposed system and are presented in Appendix A. The drawings provide an overview of the entire project and include plans for the intake, sediment basin, and outlet area, details and a profile through the wetland system. The plans provide the basis for calculating quantities to estimate probable cost.

Estimate of Probable Costs

A detailed estimate of probable costs was prepared for the proposed system. The estimate includes capital, operation and maintenance costs, which are summarized in Table 1 (see Appendix C for details). Capital and O&M costs were estimated to be $3,004,000 and $145,800, respectively. Annualized costs for phosphorus removal of $126 and $172 per pound were calculated based on interest rates of 3% and 7%, respectively.

Recommendations

Before proceeding with a more detailed design, Brown and Caldwell recommends that several considerations be addressed.

1. Obtain and test soil samples for engineering properties and suitability for plant growth. The cost estimate assumes a nominal cost for soil amendments to facilitate growth. Due to the large area involved, the quantity of materials and labor costs for amendments could significantly increase annualized costs.

2. Determine depth to groundwater and nature of the subsoils (i.e., classification and infiltration rates). The depth to groundwater will help determine if surface flows through the wetlands system will interact with groundwater flows. Investigate if interaction with groundwater is a concern. The cost estimate identifies the probable cost of a synthetic liner for the wetland cells, but does not include the amount in the total or the annualized costs. If required, the liner costs will substantially increase annualized costs. Note that the liner may be needed for only one, two, or perhaps all three cells. A cost breakdown for all three scenarios should be performed.

3. Investigate the need to line the sediment basins with concrete to facilitate sediment excavation and removal on a regular basis. Currently, the design allows one basin to be shutdown and dried out for sediment removal, while still operating the system. If the subsoils are pervious and the groundwater levels are sufficiently below the bottom of the sediment basins, it is possible that a concrete liner would not be necessary. Costs for the liner are provided, but not included in the total or annualized costs.

4. Investigate the need to excavate to increase operation and maintenance flexibility. Currently, the design includes two feet of excavation in the vegetated wetland cell (cells A-2 and B-2) and the sediment basins. This excavation represents approximately 18% of the capital costs for the facilities. This cost for additional sediment and biomass storage provided by the excavation should be compared to the increase in operating and long-term maintenance costs if excavation were eliminated.

5. Investigate the short and long-term effects of maximizing the flow through the system on the ability to remove phosphorus to determine best design flow rate. This design is based on maximizing pounds of phosphorus removed on an annual basis, which requires relatively high loading rates (i.e., short hydraulic residence times).

6. Identify requirements for permitting and include additional facilities and other costs, if required, in the annualized cost comparison.

7. Review cost estimate for the project based on construction under the direction of the Pioneer Irrigation District. This will provide a range of costs upon which the decision to proceed with design and construction can be

made. A range of costs is particularly appropriate in this instance, because the ability of the wetlands to remove phosphorus will vary by season.

8. Perform a site evaluation to confirm that wetlands do not exist. National Wetland Inventory maps were reviewed to assess the possibility of existing wetlands for this conceptual design.

9. Acquire additional data on flood storage function of site under existing conditions. Aerial photographs from the Bureau of Reclamation in Boise, Idaho, suggest this area has been relatively minor in the past, but a floodplain analysis was not available to better assess the risks.

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Addendum to Conceptual Design of a Combined Sediment (Retention) Basin/Constructed Wetland System
March 20, 2000

This document highlights the key assumptions for the Conceptual Design of a Combined Sediment (Retention) Basin/Constructed Wetland System. Also presented is an analysis of the sensitivity of the influent total phosphorus concentration and the associated annualized cost.

At the request of Mr. Robbin Finch, Brown and Caldwell has refined the total phosphorus removed (pounds) using an influent concentration of 0.366 mg/L. The initial conceptual design used a concentration of 0.322 mg/L, which was based on USGS 1994 – 1998 annual average data. The refined conceptual design is based on the use of the irrigation season only and reflects the median concentration as collected by Boise City at the Mason Creek confluence from 1994 – 1998. Note that these numbers are for a ***conceptual design only*** many factors were assumed (e.g., removal efficiency, actual performance) and can change depending on the actual design.

Original Conceptual Design

Detail regarding the Original Conceptual Design assumptions was presented in the November 16, 1999 Brown and Caldwell Technical Memorandum, "Wastewater Treatment and Water Quality Planning, Conceptual Design of a Combined Sediment (Retention) Basin/Wetland System". The Original Conceptual Design conclusions are briefly described below.

- TP, as bound with TSS, removed by the sedimentation basins = 1,040 pounds/season (assuming that for every ton of sediment removed, one pound of TP was removed)
- TP removed by the wetlands = 860 pounds/season
- Total TP removed = 1,900 pounds/season
- Total cost of wetland construction (Table 1, Technical Memo) = $3,004,000 (includes $600,000 for 60-acre land acquisition)
- O&M costs = $326,000
- Annualized O&M cost (reflected as cost per pound of phosphorus removed) ranged from $125/pound to $172/pound (based on interest rates of 3% and 7%, respectively)

Revised Conceptual Design

All of the assumptions for the Original Conceptual Design remain the same for the Revised Conceptual Design, with the exception of the refined influent phosphorus concentration of 0.366 mg/L.

Summary of TP Removal

An additional 120 pounds of TP was removed by the Revised Conceptual Design (0.366 mg/L). This reflects an overall greater removal of TP due to the higher influent concentration or volume of TP (Figure 2a). However, the efficiency of the system remains about the same (Figure 1a). Figure 2a shows the amount of TP removed (pounds) as a function of flow rate. As the flow rate through the wetlands increases, the amount of TP removed increases, but at a small increment.

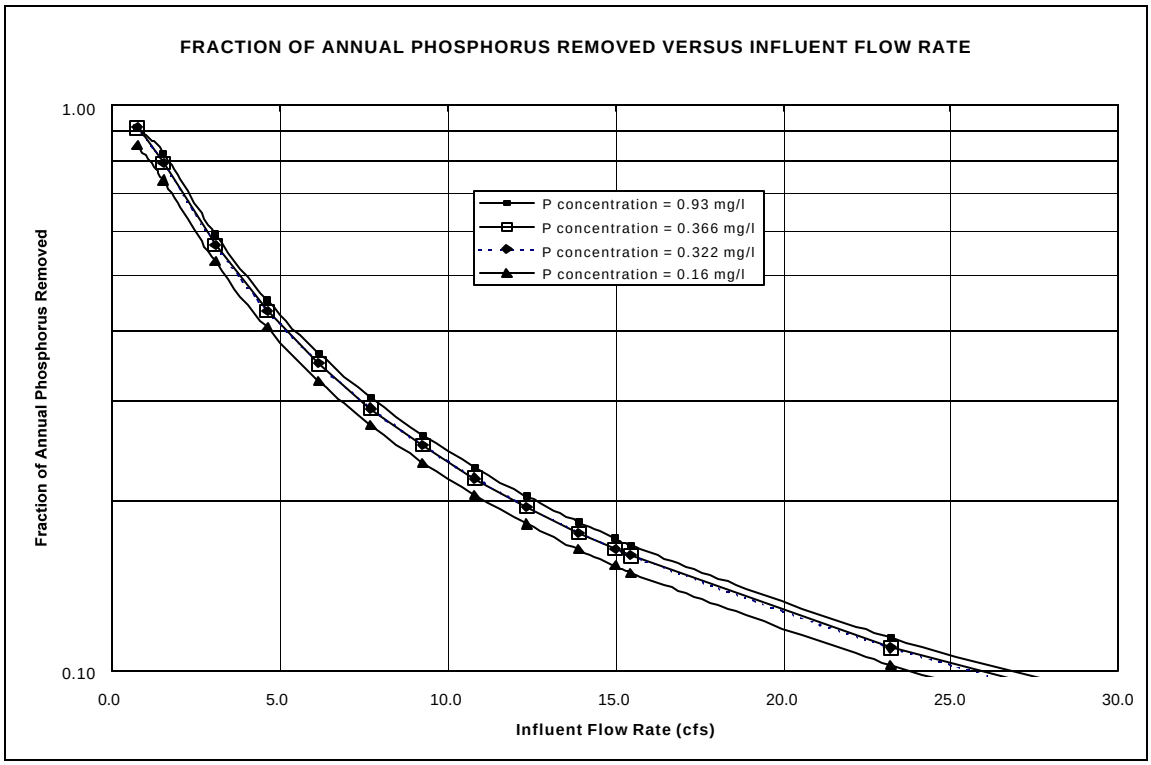

Figure 1a. Fraction of Total Phosphorus removed as a function of influent flow rate.

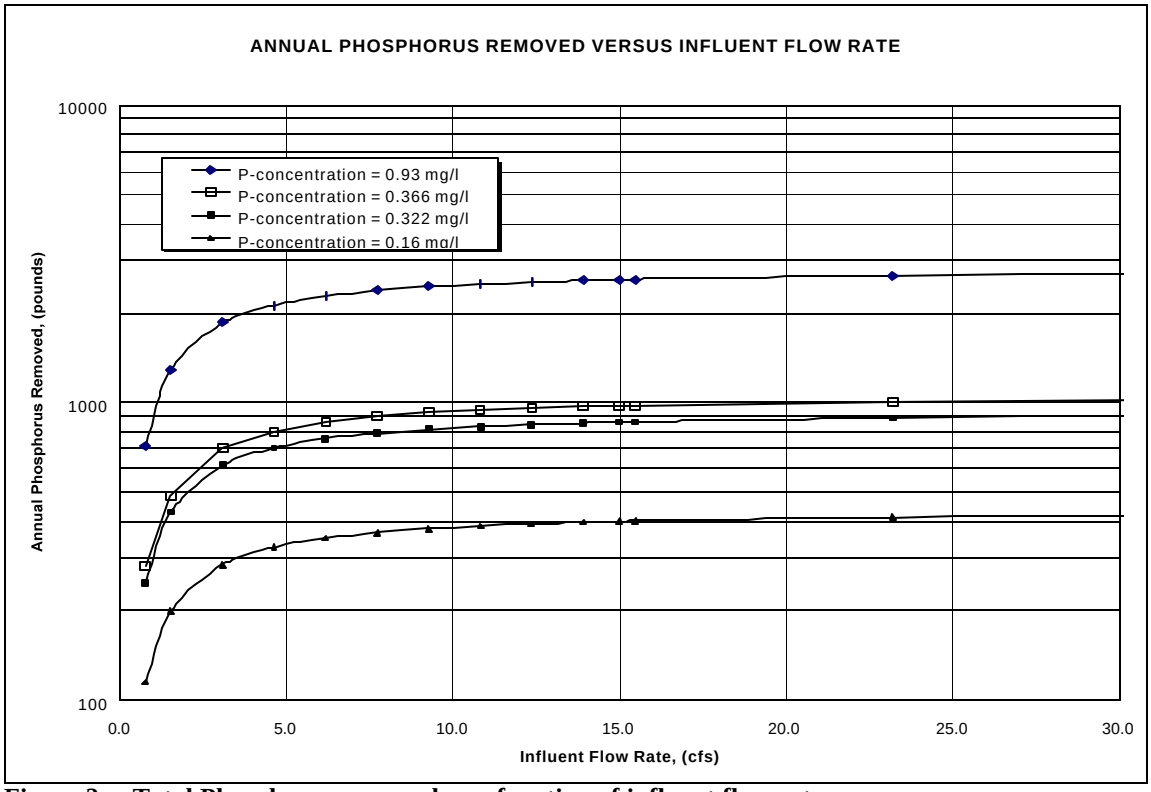

Figure 2a. Total Phosphorus removed as a function of influent flow rate.

Cost Benefit/Sensitivity Analysis

A cost benefit/sensitivity analysis was performed to assess the effect of influent TP concentration in the wetland system on the annual O&M costs. Figure 3a shows the annualized O&M costs as a function of influent concentration for two different interest rates (3% and 7%). The general trend observed for both interest rates is that for lower influent concentrations there is a greater the cost for removal of TP (per pound). For an influent concentration of 0.366 mg/L, the annualized O&M costs range from $118/pound to $161/pound (of TP removed) at interest rates of 3% and 7%, respectively. For an influent concentration of 0.322 mg/L these cost were slightly higher, ranging from $126/pound to $172/pound.

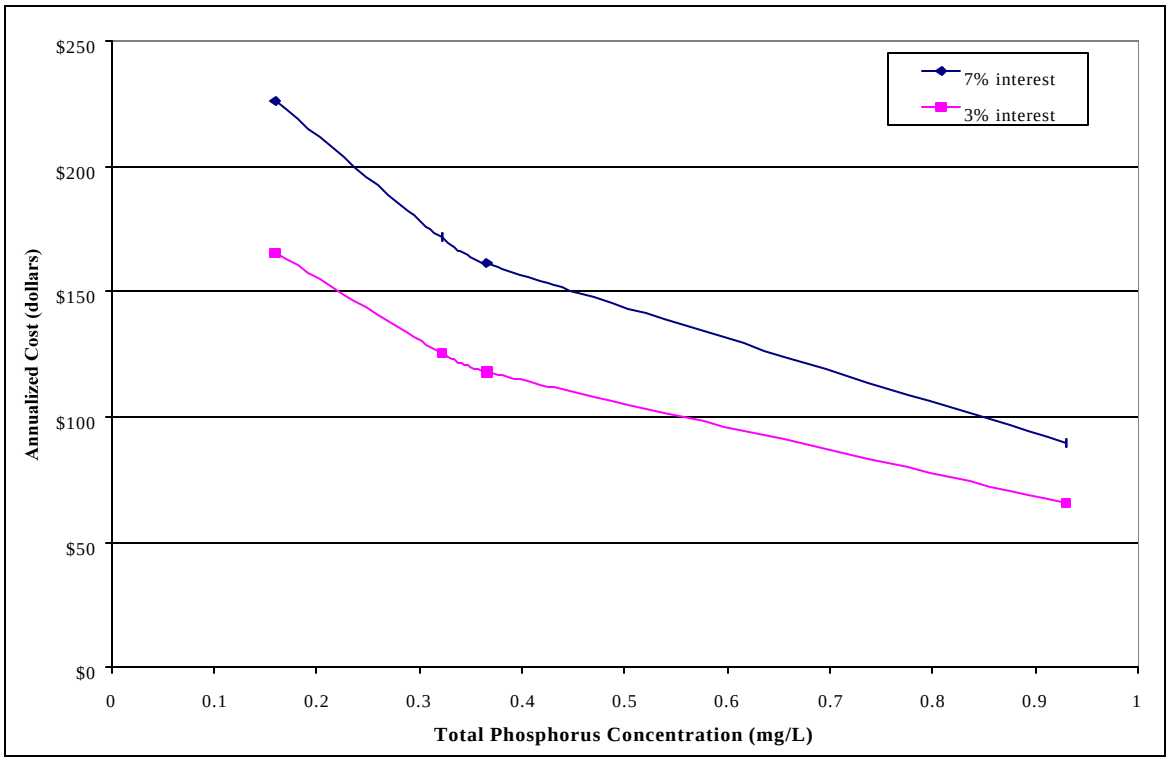

Figure 3a. Annualized Costs as a function of influent TP concentration for interest rates of 3% and 7%.

Conclusions

Overall, the efficiency of the conceptual wetland system does not measurably change at a flow rate of 15 cfs. The amount of TP removed increases slightly as a function of a greater influent concentration. The Refined Conceptual Design conclusions are described below.

- TP removed by the wetlands = 980 pounds/season
- Total TP removed = 2,020 pounds/season
- Annualized O&M cost (reflected as cost per pound of phosphorus removed) ranged from $118/pound to $161/pound (based on interest rates of 3% and 7%, respectively)

General Comments
Possible Next Steps/Issues to Consider for the Conceptual Sediment Basin/Wetland System
Presented by Brown and Caldwell (11/9/99)

Dave Ferguson, Soil Conservation Commission, Boise, ID

- Recommends that ponds be shaped differently.
  - Long and narrow, to allow for a 4 or 5 to 1 length to width, and which would allow for maintenance by a track hoe or drag line to clean the pond from each side.
  - No need to concrete line these ponds.
  - I don't recommend baffles either, as long as there is adequate space for storage capacity.

- Design each Sediment Basin (2) with a rectangular shape.
  - Approx. 600 ft long by 50ft wide, at 2 ft of depth (option: 550 x 50 with a depth at 4 ft).
  - This would have the storage capacity for 1/2 the predicted load (1,150 cubic yards).
  - One point of concern is that sediment concentrations in the spring-summer may be greater than the later summer-fall concentrations.
  - If one basin would filter water the first 100 days, it may need sized differently than the basin filtering water the second 100 because of sediment concentration differences.

Ralph Rogers, Regional Wetland Ecologist, USEPA Region 10, Seattle, WA

- What about opportunities for wetland “swales” downstream of the retention ponds?

- Soils - Ultimately will need to do on-site evaluation to assess the soils in the area.

  - As stated on page 2 of the technical memorandum, “Finally, most of the soils at the site are classified as sandy-silty loams, which are less desirable for wetland creation and may require soil amendments to facilitate plant growth”. *Could the upper layer be salvaged and replaced after excavation?*

- Any hydraulic soils mapped for project area? Inclusions?

- Wetlands
  - An on the ground assessment needs to be done to assess the potential for existing wetlands.
- Flooding – Acquire better data on flood storage function of site under existing conditions.
  - An on the ground assessment needs to be done to assess the potential for flooding and the existence of wetlands.
  - Research flood data for Lower Boise River and FEMA maps for the Lower Boise River.
  - What intensity of flooding was assessed?
  - Berm heights could be higher or lower based on flood data.

- Maintenance and Operation
  - Describe the general maintenance (and perhaps monitoring) needs of both types of systems.
  - Need discussion of maintenance requirements/schedule including basis for methods and timing of maintenance, activities, especially justification for plant removal interval of 5 years.
  - As stated in the technical memorandum, "The system is designed to be operated with minimal flows during off-season. This will help keep plants alive and minimize decay, which can lead to the remobilization of phosphorus", *what about off-season maintenance? Or will facility be operated year round—in which case plant uptake ability will vary with season?*
  - How does the plant harvest affects biomass accumulation, thus the life of the system?
  - How will temperature variations affect the plants (i.e., growing season versus dormancy)?

- Are there fish passage issues?

Eric Stiles, US Bureau of Reclamation, Denver, CO *– Please note that these comments are based on a very cursory review of the draft materials I have, and it is apparent that a good proportion of these comments could probably be clarified through some further discussion.*

- Concept plan as a model trade

- At this point, this is really the main objective for developing the concept design example.
- A question is raised, “are the design features and estimated costs an accurate representation of a “typical” wetlands facility at this site?
- How representative would these design features be for other locations or circumstances expected in the Lower Boise River basin?
- Possible references might include costs for simple to complex facilities, other types of treatment systems (e.g., Lemna), and consideration for the factors in play at other sites in the area.

- Site plan layout and water control features
  - There are a number of areas that I might suggest other considerations (some of this is personal preference).
  - Most items could be discussed later in further stages of design development to actually undertake a project at this site. The following is a list of thoughts:
    - It appears that some of the water controls could be simplified and still meet functionality.
    - Intake diversion is critical to intercept flow, but not bed load, and to minimize flood damage.
    - Suggest modified segment pond configuration to enhance sedimentation, and make easier to maintain.
    - Layout of ponds in sequence for flexible operations, and to reduce the management of areas in downstream floodplain.
- Wetland treatment design strategies.
  - Characterization of constructed treatment wetlands as even depth and grades is not accurate. Nearly all full-scale wetlands have a good deal of diversity, and may include the concept of functional compartments.
  - More to the point, is what functions, or compartments, or features are best suited to address these conditions, and are most representative of model trade goals.
- Treatment process factors. This was not reviewed in detail. The following is a list of my comments and questions:
  - Wetlands consumptive ET loss is near 80% pan evaporation is typical cfor wetlands depending on wetland and site factors.
  - Wetland trade would not be designed to address storm flows, in fact it would need to resist damage as much as possible.
  - Was the TP removal separated into sediment pond and wetlands or is the total combined?

- It was difficult to review Kadlec and Knight rate function analysis due to different conversion terms, and uncertain equations.
- There are some other considerations regarding Kadlec and Knight rate functions that might be worthwhile in further design development.
- The total annual mass reduction is given, but the design flow rate and seasonal capture assumptions are not so clear.

Ultimately, it seems clear that this strategy would have to be applied initially as a measured trade, due to the uncertainties regarding the actual phosphorus removal under these conditions. It is also clear, however, that as a default, the performance of a sediment pond provides a minimal baseline performance expectation.

Appendix E: Action Plan for Implementation of the Trading Framework

Lower Boise River Effluent Trading Demonstration Project
Action Plan for Implementation Phase
September 18, 2000

The April 21, 2000 meeting of the Framework Team marks the transition from the design phase of the demonstration project to the implementation phase. The purpose of this plan is to generally outline roles and responsibilities and a time line for the next phase of the project. The plan complements the interagency agreement that identifies the responsibilities several agencies have accepted for supporting the project in the future. The plan generally describes next steps in the following areas: overall project support and completion of the TMDLs, completion of the BMP list and related work to support agriculture participation in trading, launching the association, and program reviews and audits.

Overall Project Support

- DEQ will assume the lead in providing overall coordination and support for the project.
  Target Date: Ongoing

- DEQ will complete the TMDLs for the Lower Boise River, listed tributaries and the Snake River-Hells Canyon, incorporating key elements necessary to support trading in the appropriate documents.
  Target Date: December 31, 2001

- DEQ will draft, and conduct a public review and comment process for, the trading requirements document (regulatory vehicle for this document still under consideration). EPA will review and approve the initial document and any subsequent revisions. The document will describe the trading framework, specify the conditions and procedures for trading, and include ratios and the BMP list.
  Target Date: Draft by December 31, 2000; Final December 31, 2002; Revise every five years

- EPA will continue to be involved by issuing NPDES permits, reviewing the TMDL when it is submitted, and supporting DEQ and the stakeholders as described in the interagency agreement.
  Target Date: Ongoing

- The SCC will coordinate preparation and review of key elements of the BMP List (as described below), and will provide technical support to persons and organizations interested in marketing agriculture NPS reductions as described in the interagency agreement. Review of the BMP List will be provided by the state BMP Technical Committee.
  Target Date: Ongoing

- NRCS, SCC, and the Soil Conservation Districts will provide technical resources for development of conservation plans for individual landowners and project plans for parties developing watershed scale projects and seeking cost share funds.
  Target Date: Ongoing

- BOR will provide technical assistance, such as water resources related planning, evaluation, and modeling; engineering design; monitoring; water quality analysis, and project construction (Congressional authorization required) on a cooperative, cost-sharing basis.
  Target Date: Ongoing

- DEQ will respond to stakeholders in other watersheds who may want to develop trading systems.
  Target Date: Ongoing, as needed

Completing the BMP List

Completion of key program components to support agricultural involvement in trading is essential for program implementation. The SCC has agreed to provide overall coordination for this work. Major work areas include methods for calculating pretreatment load, and specific trading requirements for selected BMPs. These work tasks will be completed by the SCC and a contractor under contract to the Idaho Water User's Association as described below:

- The SCC will prepare a report outlining the method for calculating pretreatment load from surface irrigated lands.
  Target Date: July 2000

- The SCC will develop methods for calculating pretreatment load from irrigated pasture and animal feeding operations.
  Target Date: December 2000

- The SCC will work with IDA, and others as appropriate, to determine an approach for calculating pretreatment load infiltrating to ground water. This work will be based, at least in part, on an IDA project to evaluate the interaction of ground and surface water with respect to nutrients in the Mason Creek watershed.
  Target Date: Preliminary study results March 2001; proposed method for calculating ground water pretreatment load, December 2001

- The SCC will prepare a final report on sediment ponds to provide the technical basis for developing BMP list materials for sediment ponds.
  Target Date: May 2000

C The Idaho Water User's Association contractor, in consultation with the SCC and the BMP Technical Committee, will prepare BMP list technical information for sediment ponds and six to eight additional BMPs.

Target Date: December 2000

C The BMP Technical Committee and BMP Effectiveness Subcommittee will provide technical review of all work products prepared for the BMP list.

Target Date: Ongoing

Launching the Association

C Southwest Idaho RC&D Council will 'incubate' the Association by assisting with grant proposals and supporting initial development steps.

Target Date: Ongoing through December 2001

C The Association Work Group will:

- recruit initial directors. Target Date: September 2000
- seek funding and file for incorporation. Target Date: September 2000
- seek funding and file for 501(c)(3) status. Target Date: September 2000

C The SWIRC&D, in cooperation with the Association Work Group, will develop two to three proposals to private foundations for startup funding.

Target Date: September 2000

C The SWIRC&D, in cooperation with the Association Work Group, will develop a grant application to ESRI seeking ArcView software, and possibly a computer, for the trade tracking system.

Target Date: December 2000

C DEQ will oversee the Association's development of the trade tracking system. DEQ will establish a trade tracking system if the Association fails to do so.

Target Date: Ongoing, as needed

C The Association Work Group will complete development of an initial trade tracking database.

Target Date: June 2001

Program Review and Audits

C EPA and DEQ will be responsible for conducting routine inspections of NPDES permitted facilities, including review of records pertaining to any trades used by a permittee.

Target Date: Consistent with existing permit inspection schedule.

- EPA, DEQ, and the SCC will develop a formal agreement to outline responsibilities and procedures for SCC review of BMPs to support NPDES permit inspections.
  Target Date: July 2000

- DEQ will conduct a periodic audit of the trade tracking database.
  Target Date: December 2002, December 2004, December 2006, then every five years thereafter, to coincide with the 5-year permit cycle.

Appendix F: Inter-Agency Agreement on the Lower Boise River Effluent Trading Demonstration Project, Statement of Understanding and Responsibilities

Inter-Agency Agreement on the Lower Boise River Effluent Trading Demonstration Project:

Statement of Understanding and Responsibilities
April 21, 2000

OBJECTIVE

The purpose of this document is to provide an overview of the signatory Agencies' (hereafter referred to as "the Agencies") responsibilities established as part of the Lower Boise River effluent trading demonstration project (hereafter referred to as "the project"). As the project moves towards full implementation, some agency responsibilities will change, but this agreement will confirm that the Agencies understand the nature of their specific roles in the project and agree to work together in a cooperative manner to implement the objectives of the project. The Agencies also agree to meet on a periodic basis or as often as needed by the issues arising from the project, to review the status of the project, to assess the progress of each agency in meeting its responsibilities, to address any issues arising from the failure of any of the Agencies to meet its responsibilities, and to consider and decide on any proposed changes to those responsibilities.

BACKGROUND

This agreement has been developed because of the recognition by the U.S. Environmental Protection Agency, the Idaho Division of Environmental Quality, the Soil Conservation Commission, the Ada Soil & Water Conservation District, the Canyon Soil Conservation District, the Natural Resources Conservation Service, the U.S. Bureau of Reclamation, and the Southwest Idaho Resource Conservation & Development Council for the need to formalize an ongoing effort to develop a voluntary, market-based approach to implement the Lower Boise River Total Maximum Daily Load (hereafter referred to as "the TMDL") for phosphorous. The goal of the Agencies is to implement the TMDL in an environmentally beneficial and cost-effective manner that will achieve significant water quality improvement in the affected watersheds. In addition, the stakeholders in the Lower Boise River Watershed support effluent trading as an implementation strategy for the Lower Boise River phosphorous TMDL.

This agreement will build on the current cooperative relationships between the Agencies in the implementation of water quality improvement projects, but identify what in particular is needed from each agency to support the implementation of the effluent trading program in the Lower Boise River Watershed, as outlined in the document entitled *The Lower Boise River Watershed Effluent Trading Demonstration Project: Stakeholder Recommendations for a Trading Framework*, which will be provided by the Idaho Division of Environmental Quality's contractor Ross & Associates by the end of June 2000.

AGREEMENT

The signatory parties to this Agreement are acknowledging that the successful implementation of the Lower Boise River Effluent Trading Demonstration Project depends on the fulfillment of the particular roles and responsibilities of each agency, as well as the commitment of all of the Agencies to work together to resolve any issues and problems as they arise during the Project's implementation. The nature of the particular roles and responsibilities of each agency in the implementation of the Lower Boise River Effluent Trading Demonstration Project is summarized as follows:

Summary of Agency Roles:

U.S. Environmental Protection Agency (hereafter referred to as "EPA")

- EPA will provide program oversight through the drafting and issuance of NPDES permits, review and approval of the state trading requirements document, review of the BMP list and periodic audits of NPDES permitted facilities. In addition, EPA will develop a Memorandum of Understanding with the Idaho Division of Environmental Quality for the purposes of establishing roles and responsibilities for the audit of NPDES permitted facilities and with the Soil Conservation Commission for their role in the on-site review of the BMPs that generated credits used by those facilities.

Division of Environmental Quality (hereafter referred to as "DEQ")

- DEQ will provide ongoing program support by developing the Lower Boise River, Lower Boise River tributaries, Snake River-Hells Canyon TMDLs, preparing and maintaining the state effluent trading requirements document, providing technical support for ratios and review of the BMP list and participating in program audits and reviews. In addition, DEQ will develop a Memorandum of Understanding with EPA for the purposes of establishing roles and responsibilities for the audit of NPDES permitted facilities and with the Soil Conservation Commission for their role in the on-site review of the BMPs that generated credits used by those facilities.

Soil Conservation Commission (hereafter referred to as "SCC")

- The SCC will provide ongoing program support by providing technical expertise for development and maintenance of the BMP list, and providing technical support to agricultural nonpoint source participants for BMP design, installation and maintenance. In addition, SCC will develop a Memorandum of Understanding with EPA and DEQ for the purposes of defining the SCC's role in the on-site review of the BMPs that generated credits used by NPDES-permitted facilities, as part of the NPDES audit program administered EPA and DEQ.

Ada Soil & Water Conservation District (hereafter referred to as "Ada SWCD")

- The Ada SWCD will provide ongoing program support by reviewing all conservation plans developed for the purpose of establishing phosphorus credits for the trading program and, where necessary and funding is available, provide technical support to agricultural nonpoint source participants for BMP design, installation and maintenance. The Ada SWCD will also provide guidance in the development and maintenance of the BMP list as a member of the BMP Technical Committee.

Canyon Soil Conservation District (hereafter referred to as "Canyon SCD")

- The Canyon SCD will provide ongoing program support by reviewing all conservation plans developed for the purpose of establishing phosphorus credits for the trading program and, where necessary and funding is available, provide technical support to agricultural nonpoint source participants for BMP design, installation and maintenance. The Canyon SCD will also provide guidance in development and maintenance of the BMP list as a member of the BMP Technical Committee.

Natural Resources Conservation Service (hereafter referred to as "NRCS")

- The NRCS will provide ongoing program support by providing technical expertise for development and maintenance of the BMP list, and providing technical support to agricultural nonpoint source participants for BMP design, installation and maintenance.

Bureau of Reclamation (hereafter referred to as "USBR")

- As the operator of Arrowrock and Anderson Ranch dams, and Lucky Peak dam in coordination with the Corps of Engineers to provide flood control, and water for hydropower generation, irrigation, recreation, and fish and wildlife in the Federal Boise Project, and as the builder of the New York canal, Lake Lowell, and many drains from the Boise Project, USBR is committed to ensuring that water resources affected by the operation of USBR facilities meets water quality standards. Consequently, USBR will provide technical assistance, such as water resources related planning, evaluation, and modeling; engineering design; monitoring; and water quality analysis as well as participating in construction (Congressional authorization required) on a cooperative, cost-sharing basis with others.

Idaho Clean Water Cooperative

- The Idaho Clean Water Cooperative will develop and administer the project's trade tracking system and support the effluent trading market as desired by its members. The Association is expected to be incorporated by the end of 2000.

SW Idaho Resource Conservation & Development Council (hereafter referred to as "SWIDRCD Council")

- The SWIDRCD Council will support development of the Idaho Clean Water Cooperative that will be established to develop and administer the project's trade tracking system, providing fund-raising and administrative support until the Idaho Clean Water Cooperative is incorporated and functioning.

MEMBERSHIP, MEETINGS AND REPORTS OF THE AGENCIES

The Agencies may choose to no longer participate in the Agreement and to no longer attend its annual meetings by notifying each agency by letter at least 30 days prior to the annual meeting scheduled by DEQ. In addition, a new member agency may be added to this Agreement by an amendment voted on by the Agencies.

The Agencies agree to meet once a year to assess the status of implementing the Lower Boise River Effluent Trading Demonstration Project, to hear from each Agency how it is fulfilling its assigned role and responsibilities, and to identify, discuss and resolve any issues arising in the fulfillment of their roles and responsibilities.

Prior to the annual meeting, DEQ will prepare and distribute to the Agencies an annual status report on the implementation progress of the project and its component work products. The report will also highlight any developments or issues needing discussion at the meeting.

In the spirit of this informal agreement, it is intended that any decision called for at a meeting of the Agencies can be made by consensus. The Agencies may choose to develop another decision making process, if necessary.

The Idaho Division of Environmental Quality will assume the leadership role of calling for and making the necessary arrangements for the periodic meetings of the Agencies, to take notes at the meetings and distribute the notes to the Agencies, and to lead the implementation of any follow-up actions the Agencies agree to take as a group.

A member requesting a meeting of the Agencies, in addition to those held annually, may submit its request to DEQ, and DEQ will schedule the meeting as soon as it is feasible. In addition, the Agencies may vote to decide if the annual meeting schedule should be changed to meet more frequently or less frequently.

RESPONSIBILITIES

The particular roles of each agency are identified below. The schedule for the completion of each of the Agencies' responsibilities will be developed in cooperation with each agency, and tracked by DEQ, as part of its responsibility for implementing the TMDL.

EPA responsibilities:

Program Management

- EPA will prepare NPDES permits that include language that authorizes phosphorous trading in accordance with the design elements agreed to through the stakeholder process and consistent with the requirements of the Clean Water Act.

- EPA will fulfill its regulatory responsibilities in providing general oversight and consideration of approval of the Lower Boise River's Total Maximum Daily Load (TMDL) upon submittal by DEQ, as well as offer technical assistance to DEQ in the development of the TMDL. The degree of oversight and technical assistance provided by EPA will be determined as part of an on-going process EPA and DEQ are currently engaged in that determines the priorities and resources available for completing TMDLs in Idaho.

- EPA, along with the NRCS, SCC and DEQ, will participate in any workgroup established by the BMP Technical Committee to develop the BMP list.

BMP List

In its current role as a member of the BMP Technical Committee, and along with DEQ, NRCS, and the SCC, in any workgroup established to develop the BMP list, EPA will:

- Help identify appropriate practices for the BMP list.
- Review the approved methods for estimating pre-treatment loads for agricultural land uses (surface irrigated crops, rangeland, pasture, feedlots, etc).
- Help establish and review the design, construction, maintenance and monitoring requirements for measured BMPs.
- Help establish and review the design, construction and maintenance requirements, the equation for calculating reductions, the period of time that a credit is generated and monitoring requirements for calculated BMPs.
- Help identify and review sources of uncertainty for each equation calculating reductions.
- Add BMPs to the list on an ongoing basis as needed, and propose changes to requirements, calculations, etc., as new information is developed.
- Represent EPA's interests in effluent trading on the BMP Technical Committee.

Along with NRCS, SCC, DEQ, and other agencies and interests involved in the development of the BMP list, ensure the BMPs added to the list and the processes to establish phosphorous reduction credits upon the operation of those BMPs are scientifically based and in accordance with the Agricultural Pollution Abatement Plan and the NRCS standards, specifications, and criteria.

Program Audit/NPDES Permit Inspections

- EPA will develop a Memorandum of Understanding with the Idaho Division of Environmental Quality for the purposes of establishing roles and responsibilities for the audit of NPDES permitted facilities and with the Soil Conservation Commission for their role in the on-site review of the BMPs that generated credits used by those facilities.

DEQ responsibilities:

Project Management

- DEQ will draft and conduct a public review and comment process for the state effluent trading requirements document.

- DEQ, along with EPA, NRCS, and SCC will participate in any workgroup established by the BMP Technical Committee to develop the BMP list.

- DEQ will prepare and submit the Lower Boise River TMDL to EPA for its final review and approval. The degree of oversight and technical assistance provided by EPA will be determined as part of an on-going process EPA and DEQ are currently engaged in that determines the priorities and resources available for completing TMDLs in Idaho.

- DEQ will oversee the Idaho Clean Water Cooperative's development of the trade tracking system and periodically perform audits of the trade tracking system. DEQ will establish a trade tracking system if the Idaho Clean Water Cooperative fails to do so.

- DEQ will respond to stakeholders in other watersheds who may want to develop trading systems.

Ratios

- DEQ will review river location ratios every five years to determine if flow or pollutant conditions have changed enough to trigger a recalculation of the river location ratios. If conditions have changed to the extent they exceed the level identified as the trigger in the river location ratios document (which has been set as a variance of 30% or more on any one river location ratio occurring in two consecutive years, indicating a trend and a permanent change in the flow of the river), DEQ will recalculate the river location ratios and incorporate them into the state effluent trading requirements document following a public review and comment process, and a notification of the revision will be distributed to all market participants.

- DEQ will consult with the SCC every five years to determine if there is any need to adjust or modify the drainage delivery ratios and site location factors, and incorporate any recommended changes into the state trading requirements document following a public

review and comment process, and a notification of the revision will be distributed to all market participants.

BMP List

- In its current role as a member of the BMP Technical Committee, along with EPA, SCC, and NRCS, and in any workgroup established to develop the BMP list, DEQ will review and comment on BMP list materials prepared by the SCC to ensure BMP design, maintenance and monitoring or calculations appropriately target phosphorus reductions.

- Along with NRCS, SCC, EPA, and other agencies and interests involved in the development of the BMP list, ensure the BMPs added to the list and the processes to establish phosphorous reduction credits upon the operation of those BMPs are scientifically based and in accordance with the Agricultural Pollution Abatement Plan and the NRCS standards, specifications, and criteria.

- Publish the BMP list in the state effluent trading requirements document, with public notice and comment.

- Conduct a public review and comment process for new BMPs, and add them to the BMP list, as they are recommended by the BMP Technical Committee.

Program Audit/NPDES Permit Inspections

- DEQ will develop a Memorandum of Understanding with EPA for the purposes of establishing roles and responsibilities for the audit of NPDES permitted facilities and with the Soil Conservation Commission for their role in the on-site review of the BMPs that generated credits used by those facilities.

- DEQ will conduct a periodic audit of the trade tracking database.

<u>Soil Conservation Commission responsibilities:</u>

Program Management

- Chair the BMP Technical Committee and identify the appropriate BMP List committee members to carry out the responsibilities of developing the initial BMP List and facilitating the further addition of BMPs and refinements of calculating phosphorous reduction credits.

- Along with NRCS, Ada SWCD, and Canyon SCD, the SCC will provide technical resources for development of conservation plans for individual landowners and project plans for parties developing watershed scale projects and seeking cost share funds.

BMP List

In its current role as a member of the BMP Technical Committee, and in any workgroup established to develop the BMP list, along with EPA, DEQ, and NRCS, the SCC will:

- Identify appropriate practices for the BMP list.
- Develop the approved methods for estimating pre-treatment loads for agricultural land uses (surface irrigated crops, rangeland, pasture, feedlots, etc).
- Establish design, construction, maintenance and monitoring requirements for measured BMPs.
- Establish design, construction and maintenance requirements, the equation for calculating reductions, the period of time during which a credit is generated, and operation and maintenance inspections requirements for calculated BMPs.
- Identify sources of uncertainty for each equation calculating reductions.
- Add BMPs to the list on an ongoing basis as needed, and propose changes to requirements, calculations, etc. as new information is developed.

Along with NRCS, DEQ, EPA, and other agencies and interests involved in the development of the BMP list, ensure the BMPs added to the list and the processes to establish phosphorous reduction credits upon the operation of those BMPs are scientifically based and in accordance with the Agricultural Pollution Abatement Plan and the NRCS standards, specifications, and criteria.

Program Audit/NPDES Permit Inspections

- The SCC will develop a Memorandum of Understanding with EPA and DEQ for the purposes of defining the SCC's role in the on-site review of the BMPs that generated credits used by NPDES-permitted facilities, as part of the NPDES audit program administered by EPA and DEQ.

Ada SWCD responsibilities:

Program Management

- Along with NRCS and SCC, the Ada SWCD will provide technical resources where there exists a need and funding is available for development of conservation plans for individual landowners and BMP plans for parties developing watershed scale projects and seeking cost share funds.

Conservation Plan Development and Approval

- Approve all farm-scale conservation plans developed by NRCS, SCC, or other appropriate

technical agency or entity for the purpose of establishing nonpoint source phosphorus credits.

- Where necessary, and funding is available, seek and obtain additional technical assistance to develop conservation plans, BMP component design, and installation, operation and maintenance certification.

BMP List

Along with EPA, DEQ, SCC, and NRCS, the Ada SWCD will:

- Identify appropriate practices for the BMP list.
- Add BMPs to the list on an ongoing basis as needed, and propose changes to requirements, calculations, etc. as new information is developed.
- Serve on the BMP Technical Committee, and in any workgroup established to develop the BMP list, to review and recommend new BMPs proposed for trading.

Along with NRCS, SCC, EPA, DEQ, and other agencies and interests involved in the development of the BMP list, ensure the BMPs added to the list and the processes to establish phosphorous reduction credits upon the operation of those BMPs are scientifically based and in accordance with the Agricultural Pollution Abatement Plan and the NRCS standards, specifications, and criteria.

Canyon SCD responsibilities:

Program Management

- Along with NRCS and SCC, the Canyon SCD will provide technical resources where there exists a need and funding is available for development of conservation plans for individual landowners and project plans for parties developing watershed scale projects and seeking cost share funds.

Conservation Plan Development and Approval

- Approve all farm-scale conservation plans developed by NRCS, SCC, or other appropriate technical agency or entity for the purpose of establishing nonpoint source phosphorus credits.

- Where necessary, and funding is available, seek and obtain additional technical assistance to develop conservation plans, BMP component design, and installation, operation and maintenance certification.

BMP List

Along with EPA, DEQ, SCC, and NRCS, and in any workgroup established to develop the BMP list, the Canyon SCD will:

- Identify appropriate practices for the BMP list.
- Add BMPs to the list on an ongoing basis as needed, and propose changes to requirements, calculations, etc as new information is developed.
- Serve on the BMP Technical Committee to review and recommend new BMPs proposed for trading.

Along with NRCS, SCC, EPA, DEQ, and other agencies and interests involved in the development of the BMP list, ensure the BMPs added to the list and the processes to establish phosphorous reduction credits upon the operation of those BMPs are scientifically based and in accordance with the Agricultural Pollution Abatement Plan and the NRCS standards, specifications, and criteria.

NRCS responsibilities:

Program Management

- Along with SCC, Ada SWCD, and Canyon SCD, the NRCS will provide technical resources for development of conservation plans for individual landowners and project plans for parties developing watershed scale projects and seeking cost share funds.

BMP List

In its current role as a member of the BMP Technical Committee, along with EPA, DEQ, and SCC, and in any workgroup established to develop the BMP list, the NRCS will:

- Identify appropriate practices for the BMP list.
- Develop the approved methods for estimating pre-treatment loads for agricultural land uses (surface irrigated crops, rangeland, pasture, feedlots, etc).
- Establish design, construction, maintenance and monitoring requirements for measured BMPs.
- Establish design, construction and maintenance requirements, the equation for calculating reductions, the period of time during which a credit is generated and monitoring requirements for calculated BMPs.
- Identify sources of uncertainty for each equation calculating reductions.
- Add BMPs to the list on an ongoing basis as needed, and propose changes to requirements, calculations, etc. as new information is developed.

Along with NRCS, SCC, EPA, DEQ, and other agencies and interests involved in the development of the BMP list, ensure the BMPs added to the list and the processes to establish

phosphorous reduction credits upon the operation of those BMPs are scientifically based and in accordance with the Agricultural Pollution Abatement Plan and the NRCS standards, specifications, and criteria.

USBR responsibilities:

BMP List

USBR will continue its participation in any workgroup established to develop the BMP list, or support other groups and interests in developing the BMP list, and provide technical assistance as needed.

Program Management

USBR will provide staff analysis on a cooperative, cost-sharing basis with others as needed for technical assistance, including planning, evaluation, and modeling; engineering design; monitoring; and water quality analysis.

Idaho Clean Water Cooperative

- The Idaho Clean Water Cooperative will develop and administer the project's trade tracking system and support the effluent trading market as desired by its members. The Idaho Clean Water Cooperative is expected to be incorporated by the end of 2000.

SWIDRCD Council responsibilities:

Association Development & Support

- The SWIDRCD Council will support development of the Idaho Clean Water Cooperative that will be established to develop and administer the project's trade tracking system, providing fund-raising and administrative support until the Idaho Clean Water Cooperative is incorporated and functioning.

GENERAL PROVISIONS

This agreement does not supercede any existing role, responsibility or authority previously established for each agency in the watershed. This agreement is also not intended to create any rights or trust responsibility enforceable in any cause of action by any party against the United States, its agencies, officers, or any other person.

It is mutually agreed that each party to this agreement intends to carry out all of its respective commitments and obligations under the terms of this agreement. However, each party to this agreement is subject to an appropriation or other authorization for funding in order to fulfill such commitments and obligations. Therefore, this agreement will be automatically terminated if such funding is not furnished or is otherwise not available to any party.

Inter-Agency Agreement on the Lower Boise River Effluent Trading Demonstration Project:

Statement of Understanding and Responsibilities

SIGNATORY PARTIES

This agreement is approved upon the date of the last signature.

U.S. Environmental Protection Agency, Region 10
Charles E. Findley, Deputy Regional Administrator

_____
Date

Idaho Division of Environmental Quality
C. Stephen Allred, Administrator

_____
Date

Natural Resources Conservation Service
Richard Sims, State Conservationist

_____
Date

Soil Conservation Commission
Jerry Nicolescu, Administrator

_____
Date

Ada Soil and Water Conservation District
Wayne Newbill, Chairman

_____
Date

Canyon Soil Conservation District
Jim Truesdell, Chairman

_____
Date

U.S. Bureau of Reclamation, Snake River Area Office
Jerrold Gregg, Area Manager

_____
Date

Southwest Idaho Resource Conservation
and Development Council
Joe Twitchell, Council President

_____
Date